

# Aerospace solutions



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# Aerospace

# Contents

|                                                                                            |           |                                                                  |            |
|--------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------|------------|
| <b>Unit conversions</b> .....                                                              | <b>6</b>  | <b>Rolling bearing selection for airframe applications</b> ..... | <b>35</b>  |
| Units of measurements .....                                                                | 6         | Performance and operating conditions .....                       | 35         |
| <b>SKF Group</b> .....                                                                     | <b>7</b>  | Bearing selection process .....                                  | 36         |
| <b>Company highlights</b> .....                                                            | <b>7</b>  | Selecting bearing size and options .....                         | 36         |
| <b>Sustainability</b> .....                                                                | <b>7</b>  | Bearing load carrying capability .....                           | 37         |
| <b>Rotating equipment performance</b> .....                                                | <b>8</b>  | Static load .....                                                | 37         |
| <b>SKF Care</b> .....                                                                      | <b>9</b>  | Dynamic load rating .....                                        | 38         |
| <b>Foreword</b> .....                                                                      | <b>10</b> | Lubrication .....                                                | 39         |
| <b>SKF Aerospace highlights</b> .....                                                      | <b>10</b> | Operating temperature .....                                      | 40         |
| <b>Advanced development and manufacturing capabilities</b> .....                           | <b>10</b> | Sealing and shielding .....                                      | 40         |
| <b>The product portfolio of SKF Group at the service of aerospace industry needs</b> ..... | <b>10</b> | Friction and torque .....                                        | 41         |
| <b>Catalogue contents</b> .....                                                            | <b>11</b> | Bearing interfaces .....                                         | 42         |
| <b>How to use the catalogue</b> .....                                                      | <b>12</b> | Selecting fits .....                                             | 42         |
| Principles of bearing selection .....                                                      | 12        | Axial location of bearing .....                                  | 42         |
| Product tables .....                                                                       | 12        | Bearing data .....                                               | 45         |
| Indexes .....                                                                              | 12        | Dimensions and tolerances .....                                  | 45         |
| Use case: Select a bearing for an application .....                                        | 13        | Material .....                                                   | 45         |
| Use case: Find details of a known bearing .....                                            | 13        | Surface treatments .....                                         | 46         |
| Use case: Find information about a legacy bearing .....                                    | 13        | Sealing and shielding .....                                      | 47         |
|                                                                                            |           | Internal clearance .....                                         | 47         |
|                                                                                            |           | <b>Bearing handling</b> .....                                    | <b>49</b>  |
|                                                                                            |           | Mounting .....                                                   | 49         |
|                                                                                            |           | Dismounting .....                                                | 50         |
|                                                                                            |           | Storage .....                                                    | 50         |
|                                                                                            |           | <b>Customized products</b> .....                                 | <b>51</b>  |
|                                                                                            |           | Legacy standards .....                                           | 51         |
|                                                                                            |           | <b>Product tables</b>                                            |            |
|                                                                                            |           | <b>Metric dimensions</b> .....                                   | <b>52</b>  |
|                                                                                            |           | <b>Inch dimensions</b> .....                                     | <b>78</b>  |
|                                                                                            |           | <b>Cross-reference</b> .....                                     | <b>118</b> |
|                                                                                            |           | Metric bearings .....                                            | 118        |
|                                                                                            |           | Inch bearings .....                                              | 124        |
|                                                                                            |           | <b>2 Spherical plain bearings</b> .....                          | <b>126</b> |
|                                                                                            |           | <b>Bearing terminology</b> .....                                 | <b>128</b> |
|                                                                                            |           | <b>Bearing types</b> .....                                       | <b>129</b> |
|                                                                                            |           | Metal-to-metal spherical plain bearings .....                    | 129        |
|                                                                                            |           | Self-lubricating spherical plain bearings .....                  | 130        |
|                                                                                            |           | Rod ends .....                                                   | 130        |
|                                                                                            |           | Common design features .....                                     | 130        |
|                                                                                            |           | Customized bearings .....                                        | 131        |
|                                                                                            |           | Basic selection guidelines .....                                 | 131        |
| <b>Bearing types</b> .....                                                                 | <b>16</b> |                                                                  |            |
| Rolling bearings .....                                                                     | 16        |                                                                  |            |
| Spherical plain bearings .....                                                             | 18        |                                                                  |            |
| Rod ends .....                                                                             | 22        |                                                                  |            |
| Self-lubricating journal bearings .....                                                    | 25        |                                                                  |            |
| Airframe standard bearings selection process .....                                         | 27        |                                                                  |            |
| <b>Customized and engineered bearings</b> .....                                            | <b>27</b> |                                                                  |            |
| <b>Basic bearing type selection guide</b> .....                                            | <b>28</b> |                                                                  |            |
| <b>1 Rolling bearings</b> .....                                                            | <b>30</b> |                                                                  |            |
| Bearing designs and variants .....                                                         | 32        |                                                                  |            |
| Variants .....                                                                             | 34        |                                                                  |            |
| Bearing materials .....                                                                    | 34        |                                                                  |            |
| Surface treatments .....                                                                   | 34        |                                                                  |            |
| Sealing and shielding solutions .....                                                      | 34        |                                                                  |            |
| Rod ends .....                                                                             | 34        |                                                                  |            |
| Customized bearings .....                                                                  | 34        |                                                                  |            |

## A Airframe solutions



|                                                        |            |                                                                 |            |
|--------------------------------------------------------|------------|-----------------------------------------------------------------|------------|
| <b>Metal-to-metal spherical plain bearings</b> .....   | <b>132</b> | <b>Dismounting</b> .....                                        | <b>155</b> |
| Designs and variants .....                             | 132        | <b>Storage</b> .....                                            | <b>155</b> |
| Bearing designs .....                                  | 132        | <b>Product tables Metal-to-metal spherical plain bearings</b>   |            |
| Bearing variants .....                                 | 132        | <b>Metric dimensions</b> .....                                  | <b>156</b> |
| Bearing series .....                                   | 132        | <b>Inch dimensions</b> .....                                    | <b>184</b> |
| Bearing selection process .....                        | 134        | <b>Product tables Self-lubricating spherical plain bearings</b> |            |
| Selecting bearing size and options .....               | 134        | <b>Metric dimensions</b> .....                                  | <b>214</b> |
| Load carrying capability .....                         | 134        | <b>Inch dimensions</b> .....                                    | <b>230</b> |
| Internal clearance .....                               | 136        | <b>Cross-reference</b> .....                                    | <b>268</b> |
| Lubrication .....                                      | 137        | Metal-to-metal spherical plain bearings .....                   | 268        |
| Operating temperature .....                            | 138        | Metric bearings .....                                           | 268        |
| Bearing data .....                                     | 138        | Inch bearings .....                                             | 270        |
| Material .....                                         | 138        | Self-lubricating spherical plain bearings .....                 | 272        |
| Surface treatments .....                               | 139        | Metric bearings .....                                           | 272        |
| Dimensions and tolerances .....                        | 140        | Inch bearings .....                                             | 274        |
| Sealing and shielding .....                            | 140        |                                                                 |            |
| Customized products .....                              | 141        | <b>3 Rod ends</b> .....                                         | <b>280</b> |
| <b>Self-lubricating spherical plain bearings</b> ..... | <b>142</b> | <b>Designs and variants</b> .....                               | <b>282</b> |
| Designs and variants .....                             | 142        | Optional SKF design features .....                              | 284        |
| Bearing selection process .....                        | 142        | Customized rod ends .....                                       | 284        |
| Selecting bearing size and options .....               | 142        | Rod end bearing types selection criteria .....                  | 284        |
| Load carrying capability .....                         | 144        | <b>General specifications</b> .....                             | <b>285</b> |
| Friction and torque .....                              | 146        | Ball bearing rod ends .....                                     | 285        |
| Internal clearance .....                               | 147        | Design .....                                                    | 285        |
| Operating temperature .....                            | 147        | Selecting rod end size and options .....                        | 285        |
| Bearing data .....                                     | 148        | Lubrication .....                                               | 285        |
| Material .....                                         | 148        | Operating temperature .....                                     | 285        |
| Surface treatments .....                               | 149        | Friction and torque .....                                       | 285        |
| Dimensions and tolerances .....                        | 149        | Rod end data .....                                              | 286        |
| Sealing and shielding .....                            | 149        | Metal-to-metal spherical plain bearing rod ends .....           | 287        |
| Lined bore .....                                       | 150        | Design .....                                                    | 287        |
| Customized products .....                              | 150        | Selecting rod end size and options .....                        | 287        |
| Legacy products .....                                  | 151        | Lubrication .....                                               | 288        |
| Legacy standards .....                                 | 151        | Internal clearance .....                                        | 289        |
| Customer standards .....                               | 151        | Operating temperature .....                                     | 289        |
| <b>Bearing interfaces</b> .....                        | <b>152</b> | Rod end data .....                                              | 289        |
| Fits and tolerances .....                              | 152        | Self-lubricating spherical plain bearing rod ends .....         | 291        |
| Mounting .....                                         | 153        | Design .....                                                    | 291        |
| Bearing retention .....                                | 154        | Selecting rod end size and options .....                        | 291        |
| Anvil staking Process .....                            | 154        | Friction and torque .....                                       | 291        |
| Roller staking .....                                   | 155        | Operating temperature .....                                     | 291        |
| Threaded or bolted retention plate .....               | 155        | Rod end data .....                                              | 291        |
|                                                        |            | Rod end bodies .....                                            | 292        |
|                                                        |            | Rod end body load carrying capability .....                     | 292        |
|                                                        |            | Rod end head shape .....                                        | 293        |
|                                                        |            | Rod end body features .....                                     | 293        |

|                                                         |            |                                               |            |
|---------------------------------------------------------|------------|-----------------------------------------------|------------|
| <b>Bearing handling</b> .....                           | <b>294</b> | <b>5 Engineered pulleys</b> .....             | <b>428</b> |
| Mounting .....                                          | 294        | <b>Designs and variants</b> .....             | <b>430</b> |
| Dismounting .....                                       | 294        | <b>Pulley selection process</b> .....         | <b>430</b> |
| Storage .....                                           | 294        | Load carrying capability .....                | 431        |
| <b>Customized products</b> .....                        | <b>295</b> | Lubrication .....                             | 431        |
| Legacy products .....                                   | 295        | Operating temperature .....                   | 431        |
| Legacy standards .....                                  | 295        | Internal clearance .....                      | 431        |
| <b>Product tables</b> .....                             |            | Material .....                                | 431        |
| <b>Metric dimensions</b> .....                          | <b>296</b> | Rolling bearings .....                        | 431        |
| <b>Inch dimensions</b> .....                            | <b>322</b> | Pulley bodies .....                           | 431        |
| <b>Cross-reference</b> .....                            | <b>382</b> | Surface treatments .....                      | 432        |
| Ball bearing rod ends .....                             | 382        | Rolling bearings .....                        | 432        |
| Self-lubricating spherical plain bearing rod ends ..... | 386        | Pulley bodies .....                           | 432        |
| <b>4 Self-lubricating journal bearings</b> .....        | <b>390</b> | Sealing solutions .....                       | 432        |
| <b>Designs and variants</b> .....                       | <b>392</b> | <b>Legacy products</b> .....                  | <b>432</b> |
| Shell materials .....                                   | 392        | <b>6 Engineered needle bearings</b> .....     | <b>434</b> |
| Surface treatments .....                                | 392        | <b>Designs and variants</b> .....             | <b>436</b> |
| Liners .....                                            | 392        | <b>Basic selection process</b> .....          | <b>436</b> |
| Customized bearings .....                               | 392        | Load carrying capability .....                | 436        |
| <b>Bearing selection process</b> .....                  | <b>394</b> | Lubrication .....                             | 437        |
| Selecting bearing size and options .....                | 394        | Lubricants .....                              | 437        |
| Load carrying capability .....                          | 394        | Operating temperature .....                   | 437        |
| Static load limits .....                                | 394        | Material .....                                | 437        |
| Dynamic load rating .....                               | 394        | Surface treatments .....                      | 437        |
| Bearing life .....                                      | 394        | <b>Mounting</b> .....                         | <b>437</b> |
| Friction and torque .....                               | 394        | <b>7 Engineered composite solutions</b> ..... | <b>438</b> |
| Operating temperature .....                             | 394        | <b>Design and variants</b> .....              | <b>440</b> |
| Selecting fit .....                                     | 396        | Structural rods .....                         | 440        |
| Fits and tolerances .....                               | 396        | Adjustable rods .....                         | 441        |
| Counterface surfaces .....                              | 396        | Other composite solutions .....               | 441        |
| Metric bearings .....                                   | 397        |                                               |            |
| Inch bearings .....                                     | 398        |                                               |            |
| Bearing data .....                                      | 401        |                                               |            |
| Material .....                                          | 401        |                                               |            |
| Surface treatments .....                                | 401        |                                               |            |
| <b>Bearing handling</b> .....                           | <b>402</b> |                                               |            |
| Lubrication .....                                       | 402        |                                               |            |
| Mounting .....                                          | 402        |                                               |            |
| Interference fit .....                                  | 402        |                                               |            |
| Retaining compound .....                                | 402        |                                               |            |
| Dismounting .....                                       | 402        |                                               |            |
| Storage .....                                           | 402        |                                               |            |
| <b>Customized products</b> .....                        | <b>403</b> |                                               |            |
| Legacy products .....                                   | 403        |                                               |            |
| Legacy standards .....                                  | 403        |                                               |            |
| Customer standards .....                                | 403        |                                               |            |
| <b>Product tables</b> .....                             | <b>404</b> |                                               |            |
| Metric dimensions .....                                 | 404        |                                               |            |
| Inch dimensions .....                                   | 412        |                                               |            |
| <b>Cross-reference</b> .....                            | <b>426</b> |                                               |            |
| Metric bearings .....                                   | 426        |                                               |            |
| Inch bearings .....                                     | 426        |                                               |            |

## B Customized bearings for aeroengine solutions

|                                                       |            |
|-------------------------------------------------------|------------|
| <b>8 Customized bearings for aeroengine solutions</b> | <b>444</b> |
| <b>Design and variants</b>                            | <b>447</b> |
| Sizes                                                 | 448        |
| Tolerances                                            | 448        |
| Special design features and options                   | 448        |
| Materials                                             | 449        |
| Materials of rings and rolling elements               | 449        |
| Materials of cages                                    | 449        |
| <b>Storage</b>                                        | <b>450</b> |
| <b>Bearing remanufacturing</b>                        | <b>450</b> |

## C Other aerospace solutions

|                                                    |            |
|----------------------------------------------------|------------|
| <b>9 Aerospace thin section bearings</b>           | <b>454</b> |
| <b>SKF Reali-Slim thin section bearings</b>        | <b>456</b> |
| Sizes                                              | 456        |
| Bearing types and common design features overview  | 457        |
| <b>Options</b>                                     | <b>459</b> |
| Cage types                                         | 459        |
| Sealing and shielding                              | 460        |
| Materials                                          | 460        |
| Rings and balls                                    | 460        |
| Cages                                              | 461        |
| Seals                                              | 461        |
| Coatings                                           | 461        |
| <b>Bearing remanufacturing</b>                     | <b>461</b> |
| Engineered designs                                 | 461        |
| Ultra-Slim thin section bearings                   | 461        |
| Other engineered designs                           | 461        |
| <b>10 Aerospace specialty and engineered balls</b> | <b>462</b> |
| <b>Products</b>                                    | <b>464</b> |
| Flatted balls                                      | 464        |
| Hollow balls                                       | 464        |
| Ball plugs                                         | 465        |
| Tooling and checking balls                         | 465        |
| Master ball sets                                   | 465        |
| <b>Materials</b>                                   | <b>466</b> |
| <b>Ball grades</b>                                 | <b>467</b> |
| <b>11 Aerospace sealing solutions</b>              | <b>468</b> |
| <b>Product range</b>                               | <b>470</b> |
| <b>Materials</b>                                   | <b>470</b> |
| <b>Sealing rings</b>                               | <b>471</b> |
| <b>Aerospace carbon seals for turbine engines</b>  | <b>472</b> |
| Applications                                       | 472        |

|                                             |            |
|---------------------------------------------|------------|
| <b>Radial shaft seals</b>                   | <b>472</b> |
| <b>Diaphragm seals and boots</b>            | <b>473</b> |
| <b>Cassette seals</b>                       | <b>473</b> |
| <b>Wear sleeves</b>                         | <b>473</b> |
| SKF Speedi-Sleeve                           | 473        |
| SKF Speedi-Sleeve Gold                      | 473        |
| Custom designed wear sleeves                | 473        |
| <b>Hydraulic seals</b>                      | <b>474</b> |
| Piston seals                                | 474        |
| Rod and buffer seals                        | 474        |
| Wiper seals                                 | 474        |
| Guide rings                                 | 474        |
| <b>Fluid handling seals</b>                 | <b>475</b> |
| SKF Spectraseal                             | 475        |
| Rotary manifold seals                       | 475        |
| Locking T-seals                             | 475        |
| <b>12 Elastomeric and damping solutions</b> | <b>476</b> |
| <b>Product range</b>                        | <b>478</b> |
| Elastomeric bearings                        | 478        |
| Isolators and mounts                        | 479        |
| Dampers                                     | 479        |

## D Index

|                    |            |
|--------------------|------------|
| <b>Text index</b>  | <b>482</b> |
| <b>Table index</b> | <b>490</b> |

# Unit conversions

| Quantity                | Unit                   | Conversion          |                           |                      |                             |
|-------------------------|------------------------|---------------------|---------------------------|----------------------|-----------------------------|
| <b>Length</b>           | inch                   | 1 mm                | 0.03937 in                | 1 in                 | 25,4 mm                     |
|                         |                        |                     |                           |                      |                             |
| <b>Area</b>             | square inch            | 1 mm <sup>2</sup>   | 0.00155 in <sup>2</sup>   | 1 in <sup>2</sup>    | 645,16 mm <sup>2</sup>      |
|                         | square foot            | 1 m <sup>2</sup>    | 10.76 ft <sup>2</sup>     | 1 ft <sup>2</sup>    | 0,0929 m <sup>2</sup>       |
| <b>Volume</b>           | cubic inch             | 1 cm <sup>3</sup>   | 0.061 in <sup>3</sup>     | 1 in <sup>3</sup>    | 16,387 cm <sup>3</sup>      |
|                         | cubic foot             | 1 m <sup>3</sup>    | 35 ft <sup>3</sup>        | 1 ft <sup>3</sup>    | 0,02832 m <sup>3</sup>      |
|                         | imperial gallon        | 1 l                 | 0.22 gallon               | 1 gallon             | 4,5461 l                    |
|                         | US gallon              | 1 l                 | 0.2642 US gallon          | 1 US gallon          | 3,7854 l                    |
| <b>Speed, velocity</b>  | foot per second        | 1 m/s               | 3.28 ft/s                 | 1 ft/s               | 0,3048 m/s                  |
|                         | mile per hour          | 1 km/h              | 0.6214 mph                | 1 mph                | 1,609 km/h                  |
| <b>Mass</b>             | ounce                  | 1 g                 | 0.03527 oz                | 1 oz                 | 28,35 g                     |
|                         | pound                  | 1 kg                | 2.205 lb                  | 1 lb                 | 0,45359 kg                  |
|                         | short ton              | 1 tonne             | 1.1023 short ton          | 1 short ton          | 0,90719 tonne               |
|                         | long ton               | 1 tonne             | 0.9842 long ton           | 1 long ton           | 1,0161 tonne                |
| <b>Density</b>          | pound per cubic inch   | 1 g/cm <sup>3</sup> | 0.0361 lb/in <sup>3</sup> | 1 lb/in <sup>3</sup> | 27,68 g/cm <sup>3</sup>     |
| <b>Force</b>            | pound-force            | 1 N                 | 0.225 lbf                 | 1 lbf                | 4,4482 N                    |
| <b>Pressure, stress</b> | pounds per square inch | 1 MPa               | 145 psi                   | 1 psi                | 6,8948 × 10 <sup>3</sup> Pa |
|                         |                        | 1 N/mm <sup>2</sup> | 145 psi                   |                      |                             |
|                         |                        | 1 bar               | 14.5 psi                  | 1 psi                | 0,068948 bar                |
| <b>Moment</b>           | pound-force inch       | 1 Nm                | 8.85 lbf-in               | 1 lbf-in             | 0,113 Nm                    |
| <b>Power</b>            | foot-pound per second  | 1 W                 | 0.7376 ft-lb/s            | 1 ft-lb/s            | 1,3558 W                    |
|                         | horsepower             | 1 kW                | 1.36 hp                   | 1 hp                 | 0,736 kW                    |
| <b>Temperature</b>      | degree                 | Celsius             | $t_C = 0.555 (t_F - 32)$  | Fahrenheit           | $t_F = 1,8 t_C + 32$        |

## Units of measurements

Airframe bearings use metric or inch dimensions. When bearings are specified in inch dimensions, you will also find the metric values where relevant. Specified values in the two measurement systems are typically rounded. Therefore, values obtained using conversion formulae may not exactly match those specified.

If you need more unit conversions, use the conversion table above.

## Company highlights

Since the start of SKF in 1907, our aim has been to help create competitive advantages for our customers by continuously developing new technologies and new products. We partner with a wide range of customers around the world, in over 40 industries, to help solve their toughest engineering challenges.

This hands-on experience is combined with SKF knowledge about bearings and units, seals, services and lubrication systems to support our customers over their full life cycle of their products, providing outstanding performance and reliability to meet the challenges of today and the future.

SKF provides products, services and solutions which help customers improve safety and process efficiency, reduce friction and extend asset service life, as well as reduce waste, use of material and achieve other sustainability benefits.

These benefits are also the result of the integration of sustainability in all our activities, our commitment to SKF Care principles and our approach with rotating equipment performance (REP).

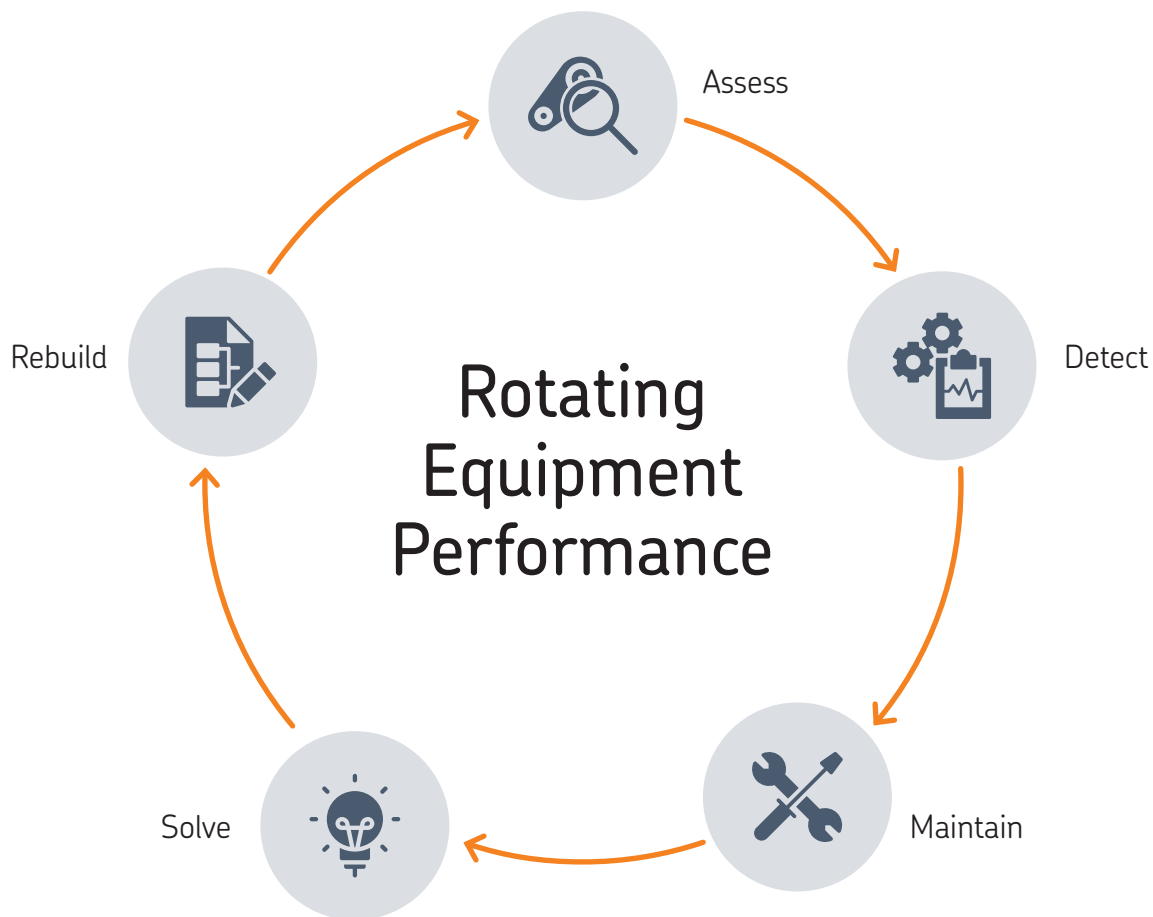
## Sustainability

Sustainability challenges such as climate change, material use, energy demand, water use and health and safety drive new customer requirements and legislation. SKF was founded based on an innovation which enabled a massive increase in energy efficiency and reliability for industry. Ever since, SKF has added new technologies which increase reliability and uptime, reduce waste and consequently decrease the CO<sub>2</sub> and environmental footprint of the Group's and customers' operations.

In SKF we want to integrate sustainability in all our activities – in the products, services and customer solutions we provide. We apply life-cycle thinking to improve sustainability performance in our customer solutions, considering the selection of materials, using efficient production processes, optimising the function during customer use, and preparing for remanufacturing or recycling when the product has reached its end of life.

# Rotating equipment performance

With SKF approach to optimizing rotating equipment performance, the objective is to maximize reliability and output from industrial equipment and production processes while driving down the total cost of ownership. Whether our customers want to solve a specific rotating equipment problem, increase asset or plant performance or improve overall maintenance efficiency, SKF is the reliable partner. With access to application insights together with the right products, connected technologies and flexible business models, we at SKF can help our customers get the performance they are looking for from their rotating equipment. Contact SKF for more information.



# SKF Care

Our ambition and strategy is to create positive impact through the business we do and the way we do our business.

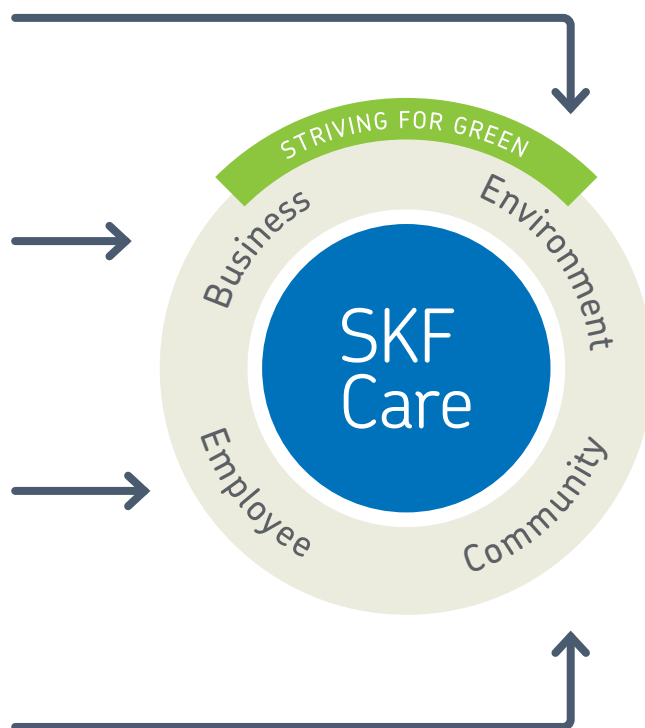
This is for the benefit of our business partners, customers, our employees, the natural environment and the communities around us. What we do creates shared value across all these perspectives:

The environmental perspective is about continually reducing the environmental impact from the Group's operations, as well as actions to significantly improve customers' environmental performance through the products, solutions and services that SKF supplies.

The business perspective is about customer focus, financial performance and returns for shareholders – with the highest standards of ethical behaviour.

The employee perspective is about ensuring a safe work environment and promoting health, education and the well-being of employees at SKF and in the supply chain.

The community perspective is about making positive contributions to the communities in which we operate and guides us to run our business in a way that supports positive development.



# Foreword

## SKF Aerospace highlights

SKF Aerospace serves all the industry players, from the Original Equipment Manufacturers (OEM) to the Maintenance Repair Overhaul (MRO) companies and supports major fixed-wing, helicopter, and engine and gearbox programmes, with:

- Airframe structural and flight control solutions
- Aircraft engine, gearbox, transmission and accessory solutions
- Many more Aerospace solutions, including Aerospace sealing solutions, Thin section bearings, Customized specialty ball solutions and Aerospace elastomeric and damping solutions

Based on SKF knowledge, supported by our long-standing experience in the industry and worldwide exposure to customers' needs with both a global and local presence (with manufacturing sites in France, USA, UK and Italy), SKF answers the critical challenges of the aerospace industry, including increasing air traffic, energy prices and environmental impacts.

SKF Aerospace delivers highly engineered standard parts, customized solutions, and services for airlines, aircraft and engine manufacturers. These solutions are the result of SKF's extensive experience and close cooperation between SKF and the customer's application experts. SKF provides total solutions over the full bearing life cycle, including design, testing and partnership.

SKF research and development focus on the needs of current and future generations of helicopters, aeroplanes, drones, engines and more, providing reduced weight and maintenance, improved pilot ergonomics and control simplicity, as well as accuracy and reliability for long service life.

## Advanced development and manufacturing capabilities

To meet increasingly demanding program requirements, SKF is taking a big, exciting step forward with Centres of Excellence that offer advanced development capabilities. With these new state-of-the-art facilities for prototyping and testing, SKF is able to accelerate new product development and speed up time to market.

SKF manufacturing excellence achieves high quality and optimum performance for aerospace products with state of the art and digitalized manufacturing capabilities, as well as continuous improvement and Six Sigma methodologies. This means that you can look forward to

even more speed, efficiency and cost-effectiveness – from design and engineering to manufacturing and delivery.

SKF has approvals to AS9100 and EN9100<sup>1)</sup> (including ISO 9001), EASA Part 21G, ISO 45001 and OHSAS 18001, ISO 14001 and ISO 50001 as well as numerous individual process approvals from customers.

Main special processes are also Nadcap certified.

Contact SKF for more information.

## The product portfolio of SKF Group at the service of aerospace industry needs

In addition to SKF Aerospace portfolio presented in this catalogue, other SKF products can be supplied by SKF Aerospace, including:

- **SKF rolling bearings (industrial bearings)**

Download a PDF of the catalogue at [skf.com/go/17000](https://www.skf.com/go/17000)

- **SKF super precision bearings**

To download a PDF document of SKF super precision bearings catalogue, go to [https://www.skf.com/binaries/327-129877/0901d19680495562-Super-precision-bearings-catalogue---13383\\_2-EN.pdf#cid-129877](https://www.skf.com/binaries/327-129877/0901d19680495562-Super-precision-bearings-catalogue---13383_2-EN.pdf#cid-129877)

- **SKF slewing ring bearings**

To download a PDF document of SKF slewing ring bearings catalogue, go to [https://www.kaydonbearings.com/downloads/catalog390/Kaydon\\_Catalog\\_390.pdf](https://www.kaydonbearings.com/downloads/catalog390/Kaydon_Catalog_390.pdf) and <https://www.skf.com/binaries/307-513670/0901d196809590fe-Slewing-bearings.pdf#cid-513670>

Such products can be supplied with the relevant SKF Aerospace quality management, including certifications, inspections, and customizations.

<sup>1)</sup> AS are American standards, EN are European standards



# Catalogue contents

This catalogue contains information about SKF products for the aerospace industry. SKF supplies:

- Airframe bearings, typically used in aerospace structures:
  - Standard and customized journal bearings
  - Standard and customized rolling bearings (using different rolling element technologies including SKF Aerospace precision rolling elements)
  - Standard and customized spherical plain bearings
  - Standard and customized rod ends
  - Engineered composite solutions
  - Engineered needle roller bearings
  - Engineered pulleys

You can find detailed information on these products in Section 1 of this catalogue.

- Aeroengine custom-designed rolling bearings, typically used in engine main-shafts and gearboxes, helicopter drivetrains, and accessory equipment solutions. They can use different rolling element technologies including SKF Aerospace precision rolling elements.

You can find an overview in Section 2 of this catalogue.

- Other aerospace solutions:
  - Aerospace Sealing Solutions, including rubber seals moulded and machined, carbon seals, and rings
  - Aerospace elastomeric and damping solutions
  - Aerospace thin section bearings
  - Aerospace specialty and engineered balls

You can find an overview in Section 3 of this catalogue.

Visit [skf.com](http://skf.com) or contact SKF to learn more about aerospace products and solutions.

The information in this catalogue reflects SKF's state-of-the-art technology and capabilities as of the day of printing. The information herein may differ from that shown in earlier catalogues because of redesign, technological developments or revised calculation methods. SKF reserves the right to continually improve its products with respect to materials, design and manufacturing methods, some of which are driven by technological developments and standard evolutions.

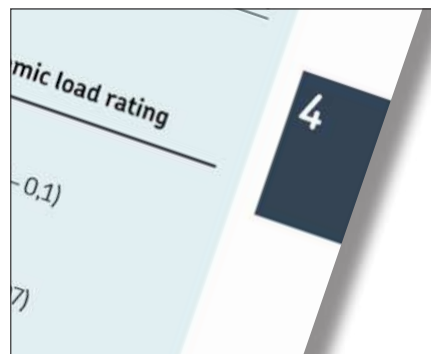
# How to use the catalogue

For each section of the catalogue, the following information is provided:

## Principles of bearing selection

This part is marked with blue bars at the page edge. It provides general relevant information about:

- Available bearing types and sizes
- Relevant bearing data (materials, surface treatments, lubrication, sealing ...)
- Information about interfaces and bearing handling requirements



## Product tables

Dedicated to standard products, these tables provide all required dimensions (metric/inch) and required information, such as standard references, dimensions, loads, clearance, or torque values. Consequently, it enables customers to find all design information needed for bearing selection.



Metric



Inch

## Indexes

The product index and text index are marked with grey bars. The product index lists series designations, relates them to the bearing type, and guides you to the relevant product section and product table. The text index lists entries in alphabetical order, and helps you locate specific information quickly.



## Use case: Select a bearing for an application

If you are unsure whether you have adequate knowledge or experience to select a bearing that best suits your application requirements, you will probably find it helpful to consult the *Bearing selection process* on **page 28** and in each product chapter.

If you are an experienced bearing expert, go directly to the section for the relevant bearing type, browse the product tables for the required size, and then look at additional details and information on more specific variants in the text part preceding the product tables.

## Use case: Find details of a known bearing

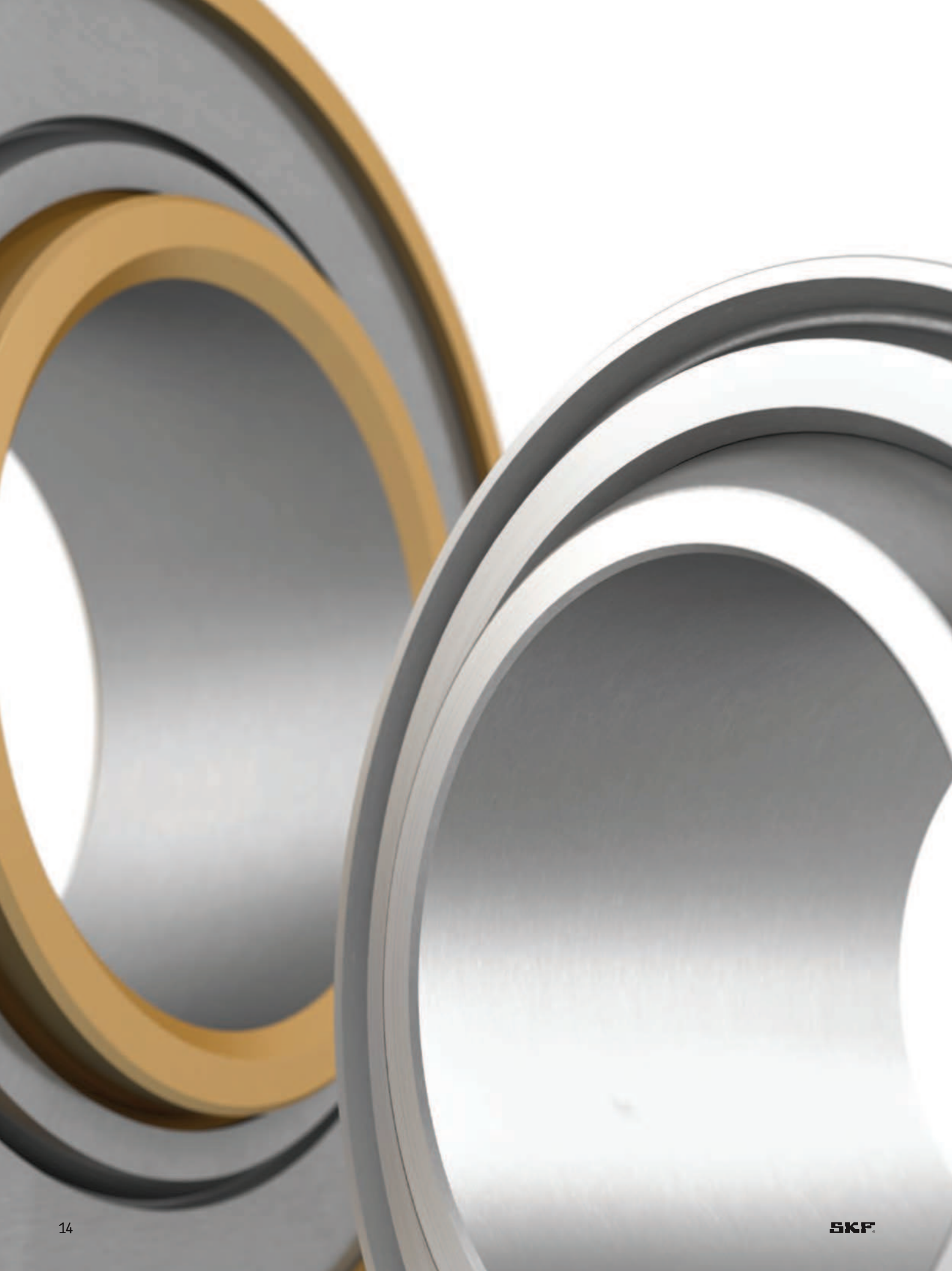
The easiest way to find detailed information about a bearing for which you have the designation is to use the product index, **page 487**. Compare the initial characters in a bearing designation with the entries in the product index. Each entry specifies the related bearing type, and the relevant product section and product table. To understand the product series used in a bearing designation, go to the text index, **page 487**, locate the entry for the suffix and follow the reference to the relevant product section where you can find detailed information.

If the bearing type is known, it is also possible to go directly to the relevant product chapter. Use the table of contents to locate information easily. The designation system is given in the product tables and the relevant cross-references to standards are given at the end of each product chapter.

## Use case: Find information about a legacy bearing

SKF legacy series and bearings compliant to legacy standards can still be supplied. For more information, look into the list of *Legacy products* and *Legacy standards* in each relevant product chapter, searching by the bearing basic designation.

For legacy products with equivalent designations from both SKF Aerospace France and SKF Aerospace U.K. Limited, SKF uses a cross-reference designation system. **Table 16 page 151** provides the cross-reference for the relevant self-lubricating spherical plain bearings and **table 9 page 295** provides the cross-reference for the relevant self-lubricating spherical plain bearing rod ends. In these tables, search for the legacy basic designation to find the relevant cross-reference designation and the related product table. The **Product index page 487** can also be used. Search for the initial characters of a legacy bearing to find the related cross-reference.



# A Airframe solutions

|                                                        |        |
|--------------------------------------------------------|--------|
| Bearing types . . . . .                                | 16     |
| Rolling bearings . . . . .                             | 16     |
| Spherical plain bearings . . . . .                     | 18     |
| Rod ends . . . . .                                     | 22     |
| Self-lubricating journal bearings . . . . .            | 25     |
| Airframe standard bearings selection process . . . . . | 27     |
| Customized and engineered bearings . . . . .           | 27     |
| Basic bearing type selection guide . . . . .           | 28     |
| <br><b>1 Rolling bearings . . . . .</b>                | <br>30 |
| <b>2 Spherical plain bearings . . . . .</b>            | 126    |
| <b>3 Rod ends . . . . .</b>                            | 280    |
| <b>4 Self-lubricating journal bearings . . . . .</b>   | 390    |
| <b>5 Engineered pulleys . . . . .</b>                  | 428    |
| <b>6 Engineered needle bearings . . . . .</b>          | 434    |
| <b>7 Engineered composite solutions . . . . .</b>      | 438    |

SKF supplies standard, customized and fully engineered airframe solutions.

With the widest range of airframe standard products, SKF can meet the most demanding application requirements and supply bearings compliant to the most common airframe standards, including international EN or AS standards, and leading customer standards.

Airframe solutions are used widely in aircraft structures. They can be found in many applications including:

- Landing gears
- Flight controls
- Actuators, attachment points and hinges
- Doors
- Helicopter rotors

SKF Aerospace supplies inch and metric bearings in different sizes and types with a wide range of design options, including different materials, surface treatments, lubrication and sealing solutions.

SKF Aerospace also supports customers with its engineering expertise and testing capabilities from investigation to qualification.

# Bearing types

SKF Aerospace supplies various types of airframe bearings:

- Rolling bearings (single or double row ball or roller bearings)
- Spherical plain bearings (metal-to-metal or self-lubricating)
- Rod ends (using rolling bearings or spherical plain bearings)
- Self-lubricating journal bearings

## Rolling bearings

Airframe rolling bearings are full complement bearings (i.e. bearings without a cage and with a full complement of rolling elements) that enable rotational movements with minimal friction.

They support high loads, guide rotating components precisely and accommodate oscillating movements or a low number of complete rotations at low rotational speed. Some bearing types can compensate for misalignment between the shaft and housing bore.

When an attachment solution is needed, airframe rolling bearings can be integrated into rod end bodies. Refer to *Rod ends* **page 280**.

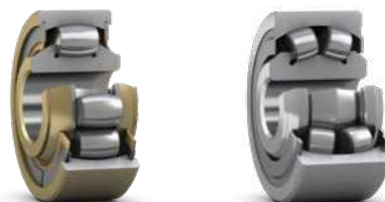
The SKF rolling bearing standard assortment is comprised of:



Deep groove ball bearings  
1 and 2 rows



Self-aligning ball bearings  
1 and 2 rows



Spherical roller bearings  
1 and 2 rows



Bearings with  
self-aligning rings

Airframe rolling bearings can use different rolling element technologies, including SKF Aerospace precision specialty balls.

As a leading manufacturer of precision specialty balls, SKF provides balls in a wide range of sizes, materials and tolerances to meet your application requirements.

SKF can also provide specialty balls for various applications including fluid control, linear guides, ball screws, or ball transfer units.

For more information, see **table 1** for metric bearings, **table 2** for bearings with inch dimensions and refer to *Rolling Bearings* **page 30** and *Aerospace specialty and engineered balls* **page 468**.

Table 1

## SKF rolling bearings, metric dimensions

| Type                                                |                                                                                    | Number of rows | Standard                             | SKF series                               | Table number | Page |
|-----------------------------------------------------|------------------------------------------------------------------------------------|----------------|--------------------------------------|------------------------------------------|--------------|------|
| Deep groove ball bearing                            |   | Single         | –                                    | JN..                                     | 1.1          | 52   |
|                                                     |                                                                                    |                | EN 3284, EN 3285, EN 3286            | JNA..                                    | 1.2          | 54   |
|                                                     |                                                                                    |                | EN 3045, EN 3046, EN 3047            | –                                        | 1.3          | 56   |
|                                                     |                                                                                    |                | EN 3281, EN 3282, EN 3283<br>EN 4033 | TA..                                     | 1.4          | 58   |
|                                                     |   | Double         | –                                    | AG..                                     | 1.5          | 60   |
|                                                     |                                                                                    |                | EN 3056, EN 3057, EN 3058            | AGN...                                   | 1.6          | 62   |
| Deep groove ball bearing<br>with self-aligning ring |   | Single         | EN 3059, EN 3060, EN 3061            | TRCE..                                   | 1.7          | 64   |
|                                                     |                                                                                    |                | EN 4041                              | TRCEI..                                  | 1.8          | 66   |
| Self-aligning ball bearing                          |   | Double         | EN 3287, EN 3288, EN 3289            | KN..                                     | 1.9          | 68   |
|                                                     |                                                                                    |                | EN 4034                              | KNRCE..                                  | 1.10         | 70   |
| Spherical roller bearing                            |   | Single         | EN 3053, EN 3054, EN 3055            | K..F, KN..F, K..FE..<br>SP1, KN..FE..SP1 | 1.11         | 72   |
|                                                     |                                                                                    |                | EN 3290, EN 3291, EN 3292            | KNA..F                                   | 1.12         | 74   |
|                                                     |  | Double         | –                                    | K..D                                     | 1.13         | 76   |

Table 2

## SKF rolling bearings, inch dimensions

| Type                                                |                                                                                     | Number of rows | Standard | SKF series                         | Table number | Page |
|-----------------------------------------------------|-------------------------------------------------------------------------------------|----------------|----------|------------------------------------|--------------|------|
| Deep groove ball bearing                            |  | Single         | AS 27640 | KP.., KP..L                        | 1.14         | 78   |
|                                                     |                                                                                     |                | AS 27641 | KP..A                              | 1.15         | 80   |
|                                                     |                                                                                     |                | AS 27642 | KP..B                              | 1.16         | 84   |
|                                                     |                                                                                     |                | –        | KP..SP.., KP..A..SP.., KP..L..SP.. | 1.17         | 90   |
|                                                     |  | Double         | AS 27646 | B500..                             | 1.18         | 92   |
|                                                     |                                                                                     |                | AS 21428 | –                                  | 1.19         | 96   |
|                                                     |                                                                                     |                | AS 27644 | DPP..                              | 1.20         | 98   |
|                                                     |                                                                                     |                | AS 27647 | DW.., DW..K2, DW..K                | 1.21         | 100  |
| Deep groove ball bearing<br>with self-aligning ring |  | Single         | AS 27648 | KP..BS                             | 1.22         | 102  |
|                                                     |                                                                                     |                | –        | –                                  | –            | –    |
| Self-aligning ball bearing                          |  | Single         | AS 27645 | KSP.., KSP..A, KSP..L              | 1.23         | 106  |
|                                                     |                                                                                     |                | –        | KSP..SP.., KSP..A..SP..            | 1.24         | 110  |
|                                                     |  | Double         | –        | KN..                               | 1.25         | 112  |
|                                                     |                                                                                     |                | AS 27643 | DSP..                              | 1.26         | 114  |
| Spherical roller bearing                            |  | Single         | –        | DSRP..                             | 1.27         | 116  |

# Spherical plain bearings

Airframe spherical plain bearings support high loads, enable multi-directional oscillation at relatively low speed. They can compensate for misalignment between the shaft and housing bore.

Airframe spherical plain bearings can be made with a greased metal-to-metal spherical contact (MM bearings) or with a self-lubricating liner (SL bearings).

When an attachment solution is needed, airframe spherical plain bearings can be supplied as part of a rod end assembly. Refer to *Rod ends*, **page 280**.

The SKF spherical plain bearing standard assortment is comprised of:



SL<sup>1)</sup> bearings swaged



SL<sup>1)</sup> bearings pre-staked



SL<sup>1)</sup> bearings swaged high misalignment



MM<sup>2)</sup> bearings slotted



MM<sup>2)</sup> bearings swaged



MM<sup>2)</sup> bearings split



MM<sup>2)</sup> bearings swaged high misalignment

For more information, see **table 3** for metric metal-to-metal bearings, **table 4** for metal-to-metal bearings with inch dimensions, **table 5** for metric self-lubricating bearings, **table 6** for self-lubricating bearings with inch dimensions and refer to *Spherical plain bearings*, **page 126**.

<sup>1)</sup> SL = Self-lubricating

<sup>2)</sup> MM = Metal-to-metal



Table 3

## SKF metal-to-metal spherical plain bearings, metric dimensions

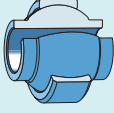
| Design           |                                                                                   | Variant           | Standard         | SKF series | Table number | Page |
|------------------|-----------------------------------------------------------------------------------|-------------------|------------------|------------|--------------|------|
| Loader slot      |  | EN                | EN 2336, EN 2588 | GE         | 2.1          | 156  |
|                  |                                                                                   | SKF               | –                | GL         | 2.2          | 160  |
|                  |                                                                                   | High load         | –                | GLS...RTG  | 2.3          | 164  |
|                  |                                                                                   | Wide              | –                | GT         | 2.4          | 166  |
| Swaged           |  | Light             | EN 2335          | MA         | 2.5          | 168  |
|                  |                                                                                   | Narrow            | –                | ME         | 2.6          | 172  |
|                  |                                                                                   | Wide              | –                | ML         | 2.7          | 176  |
|                  |  | High misalignment | –                | MT         | 2.8          | 180  |
|                  |                                                                                   |                   |                  |            |              |      |
| Split inner ring |  | SKF               | –                | 2 PL       | 2.9          | 182  |

Table 4

## SKF metal-to-metal spherical plain bearings, inch dimensions

| Design           |                                                                                     | Variant           | Standard               | SKF series | Table number | Page |
|------------------|-------------------------------------------------------------------------------------|-------------------|------------------------|------------|--------------|------|
| Loader slot      |  | Wide              | –                      | GT         | 2.10         | 184  |
| Swaged           |  | Narrow            | AS 21154, AS 21155     | ME         | 2.11         | 186  |
|                  |                                                                                     | Narrow            | EN 6046                | ENE        | 2.12         | 190  |
|                  |                                                                                     | Wide              | –                      | ML         | 2.13         | 194  |
|                  |                                                                                     | Wide              | EN 4265, EN 4266       | ENL        | 2.14         | 198  |
|                  |  | High misalignment | –                      | MT         | 2.15         | 202  |
|                  |                                                                                     | AS                | AS 81936/1, AS 81936/2 | QXMB       | 2.16         | 206  |
| Split inner ring |  | SKF               | –                      | 2 PL       | 2.17         | 210  |

Table 5

## Self-lubricating spherical plain bearings, metric dimensions

| Figure                                                                              | Variant           | Standard         | SKF series | Cross-reference to legacy SKF Aerospace France designation system Lons-le-Saunier (formerly known as SARMA) | Cross-reference to legacy SKF Aerospace U.K. Limited designation system Clevedon (formerly known as AMPEP)                                                                                                                                                                | Table number | Page |
|-------------------------------------------------------------------------------------|-------------------|------------------|------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|
|    | Light             | EN 3048, EN 4037 | LEN..      | XRA..                                                                                                       | 11C..N.. (not plated)<br>11F..N.. (chromium plated sphere)                                                                                                                                                                                                                | 2.18         | 214  |
|                                                                                     | Narrow            | EN 2584, EN 4038 | NEN..      | XRE..                                                                                                       | 11C..W.. (not plated) or 11F..W.. (chromium plated sphere) for bore code 5 and 22<br>11C..N.. (not plated) or 11F..N.. (chromium plated sphere) for bore code 6 and 10<br>11C..E.. (not plated) or 11F..E.. (chromium plated sphere) for bore code 8 and ≥ 12 (except 22) | 2.19         | 216  |
|                                                                                     | Wide              | EN 2585, EN 4039 | WEN..      | XRL..                                                                                                       | 11C..E.. (not plated) or 11F..E.. (chromium plated sphere) for bore code 5<br>11C..W.. (not plated) or 11F..W.. (chromium plated sphere) for bore code ≥ 6                                                                                                                | 2.20         | 220  |
|   | High misalignment | EN 4040          | HMEN..     | RL..SP.. (stepped design inner ring)                                                                        | 11E..H (blended design inner ring)                                                                                                                                                                                                                                        | 2.21         | 224  |
|                                                                                     | High misalignment | –                | XRT..      | –                                                                                                           | –                                                                                                                                                                                                                                                                         | 2.22         | 226  |
|  | Pre-staked        | –                | XRL..FR    | –                                                                                                           | –                                                                                                                                                                                                                                                                         | 2.23         | 228  |

Table 6

## Self-lubricating spherical plain bearings, inch dimensions

| Figure                                                                              | Variant                     | Standard               | SKF series | Cross-reference to legacy SKF Aerospace France designation system Lons-le-Saunier (formerly known as SARMA) | Cross-reference to legacy SKF Aerospace U.K. Limited designation system Clevedon (formerly known as AMPEP) | Table number | Page |
|-------------------------------------------------------------------------------------|-----------------------------|------------------------|------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------|------|
|    | Narrow controlled clearance | –                      | SN..ZT     | –                                                                                                           | –                                                                                                          | 2.24         | 230  |
|                                                                                     | Narrow                      | NSA 8134, NSA 8136     | SN..       | –                                                                                                           | –                                                                                                          | 2.25         | 232  |
|                                                                                     | Narrow                      | AS 14101, AS 14104     | NAS..      | XRE..                                                                                                       | 11HN.. (inner ring sphere surface coated)<br>11BN..                                                        | 2.26         | 236  |
|                                                                                     | Narrow lined bore           | AS 81820/1, AS 81820/4 | NAS..A..   | XRE..A..                                                                                                    | 11LHN.. (inner ring sphere surface coated)<br>11LBN..                                                      | 2.27         | 240  |
|                                                                                     | Wide                        | NSA 8135, NSA 8137     | SW..       | –                                                                                                           | –                                                                                                          | 2.28         | 244  |
|                                                                                     | Wide                        | AS 14102, AS 14103     | WAS..      | XRL..                                                                                                       | 11HW.. (inner ring sphere surface coated)<br>11BW..                                                        | 2.29         | 248  |
|                                                                                     | Wide lined bore             | AS 81820/2, AS 81820/3 | WAS..A..   | XRL..A..                                                                                                    | 11LHW.. (inner ring sphere surface coated)<br>11LBW..                                                      | 2.30         | 254  |
|   | High misalignment           | –                      | SH..       | –                                                                                                           | –                                                                                                          | 2.31         | 256  |
|                                                                                     | High misalignment           | –                      | 11..H..    | –                                                                                                           | –                                                                                                          | 2.32         | 258  |
|                                                                                     | High misalignment           | –                      | XRT..      | –                                                                                                           | –                                                                                                          | 2.33         | 260  |
|  | Pre-staked                  | –                      | XRL..FR    | –                                                                                                           | –                                                                                                          | 2.34         | 264  |

# Rod ends

Rod ends provide the same functions as the bearing they use together with an easy attachment and positioning solution to the application.

The SKF rod end standard assortment is comprised of:



Rod ends with integrated self-aligning ball bearings



Rod ends with inserted spherical plain bearings (SL<sup>1</sup>) or MM<sup>2</sup>)



Rod ends with integrated MM spherical plain bearings

Refer to rolling bearing and spherical plain bearing chapters for more information.

For more information, see **table 7** for metric bearings, **table 8** for bearings with inch dimensions and refer to *Rod ends* **page 280**.

Table 7

## SKF rod ends, metric dimensions

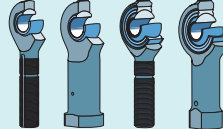
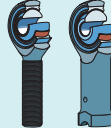
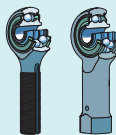
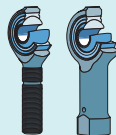
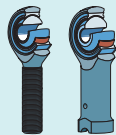
| Type                      |                                                                                    | Thread     | Standard | SKF rod end series | SKF bearing series      | Cross-reference to legacy SKF Aerospace France designation system<br>Lons-le-Saunier (formerly known as SARMA) | Cross-reference to legacy SKF Aerospace U.K. Limited designation system<br>Clevedon (formerly known as AMPEP) | Table number | Page |
|---------------------------|------------------------------------------------------------------------------------|------------|----------|--------------------|-------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------|------|
| Ball bearing rod ends     |   | Integrated | External | EN 3541, EN 4036   | C..MJ, CN..MJ N/A       | –                                                                                                              | –                                                                                                             | 3.1          | 296  |
|                           |                                                                                    | Integrated | External | –                  | C..M, CN..M, CN..M..SP1 | –                                                                                                              | –                                                                                                             | 3.2          | 298  |
| Metal-to-metal rod ends   |   | Integrated | External | –                  | EM..                    | N/A                                                                                                            | –                                                                                                             | 3.3          | 300  |
|                           |                                                                                    | Inserted   | External | –                  | EMJ/ML..                | ML..R metric                                                                                                   | –                                                                                                             | 3.4          | 302  |
|                           |                                                                                    | Inserted   | External | –                  | EMJ/MT..                | MT..R metric                                                                                                   | –                                                                                                             | 3.5          | 304  |
|                           |                                                                                    | Integrated | Internal | –                  | EF..                    | N/A                                                                                                            | –                                                                                                             | 3.6          | 306  |
|                           |                                                                                    | Inserted   | Internal | –                  | EFJ/ML..                | ML..R metric                                                                                                   | –                                                                                                             | 3.7          | 308  |
|                           |                                                                                    | Inserted   | Internal | –                  | EFJ/MT..                | MT..R metric                                                                                                   | –                                                                                                             | 3.8          | 310  |
| Self-lubricating rod ends |  | Inserted   | External | EN 2498, EN 4198   | EMA..                   | HMEN..R metric                                                                                                 | –                                                                                                             | 3.9          | 312  |
|                           |                                                                                    | Inserted   | External | –                  | EMJ/RL..                | WEN..R metric                                                                                                  | –                                                                                                             | 3.10         | 314  |
|                           |                                                                                    | Inserted   | External | –                  | EMJ/RT..                | XRT..R metric                                                                                                  | –                                                                                                             | 3.11         | 316  |
|                           |                                                                                    | Inserted   | Internal | –                  | EFJ/RL..                | WEN..R metric                                                                                                  | –                                                                                                             | 3.12         | 318  |
|                           |                                                                                    | Inserted   | Internal | –                  | EFJ/RT..                | XRT..R metric                                                                                                  | –                                                                                                             | 3.13         | 320  |

Table 8

## SKF rod ends, inch dimensions

| Type                      |                                                                                    |            | Thread   | Standard         | SKF rod end series               | SKF bearing series        | Cross-reference to legacy SKF Aerospace France designation system<br>Lons-le-Saunier (formerly known as SARMA) | Cross-reference to legacy SKF Aerospace U.K. Limited designation system<br>Clevedon (formerly known as AMPEP) | Table number | Page |
|---------------------------|------------------------------------------------------------------------------------|------------|----------|------------------|----------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------|------|
| Ball bearing rod ends     |   | Integrated | External | –                | CN..SP                           | N/A                       | –                                                                                                              | –                                                                                                             | 3.14         | 322  |
|                           |                                                                                    | Integrated | External | EN 4156, EN 4157 | CN..                             | N/A                       | –                                                                                                              | –                                                                                                             | 3.15         | 326  |
|                           |                                                                                    | Integrated | External | AS 21151         | REP..M, RA..M, N/A<br>RAP..M     | –                         | –                                                                                                              | 3.16                                                                                                          | 332          |      |
|                           |                                                                                    | Integrated | Internal | AS 21153         | REP.., REP..F., N/A<br>REPB..N.. | –                         | –                                                                                                              | 3.17                                                                                                          | 334          |      |
| Metal-to-metal rod ends   |   | Inserted   | External | –                | EMJ/..ML..R                      | ML..R inch                | –                                                                                                              | –                                                                                                             | 3.18         | 336  |
|                           |                                                                                    | Inserted   | External | –                | EMJ/..MT..R                      | MT..R inch                | –                                                                                                              | –                                                                                                             | 3.19         | 338  |
|                           |                                                                                    | Inserted   | Internal | –                | EFJ/..ML..R                      | ML..R inch                | –                                                                                                              | –                                                                                                             | 3.20         | 340  |
|                           |                                                                                    | Inserted   | Internal | –                | EFJ/..MT..R                      | MT..R inch                | –                                                                                                              | –                                                                                                             | 3.21         | 342  |
| Self-lubricating rod ends |  | Inserted   | External | AS 81935/1       | MJ/WAS..                         | WAS..R inch, EWAS..R inch | UMJ/XRL..                                                                                                      | 12BM..                                                                                                        | 3.22         | 344  |
|                           |                                                                                    | Inserted   | External | AS 81935/4       | MJ/NAS..                         | NAS..R inch, ENAS..R inch | UMJ/XRE..                                                                                                      | 12BNM..                                                                                                       | 3.23         | 346  |
|                           |                                                                                    | Inserted   | External | AS 81935/6       | PHMJ/WAS..                       | WAS..R inch, EWAS..R inch | PHUMJ/XRL..                                                                                                    | 12CM..                                                                                                        | 3.24         | 348  |
|                           |                                                                                    | Inserted   | External | AS 81935/8       | PHMJ/NAS..                       | NAS..R inch, ENAS..R inch | PHUMJ/XRE..                                                                                                    | 12CNM..                                                                                                       | 3.25         | 350  |
|                           |                                                                                    | Inserted   | External | NSA 8143         | R..M..                           | SW..G inch                | –                                                                                                              | –                                                                                                             | 3.26         | 352  |
|                           |                                                                                    | Inserted   | External | –                | EMJ/RL..R                        | WAS..R inch               | –                                                                                                              | –                                                                                                             | 3.27         | 354  |
|                           |                                                                                    | Inserted   | External | –                | EMJ/RT..R                        | XRT..R inch               | –                                                                                                              | –                                                                                                             | 3.28         | 356  |
|                           |                                                                                    | Inserted   | Internal | AS 81935/2       | FJ/WAS..                         | WAS..R inch, EWAS..R inch | UFJ/XRL..                                                                                                      | 12BF..                                                                                                        | 3.29         | 358  |
|                           |                                                                                    | Inserted   | Internal | AS 81935/5       | FJ/NAS..                         | NAS..R inch, ENAS..R inch | UFJ/XRE..                                                                                                      | 12BNF..                                                                                                       | 3.30         | 362  |
|                           |                                                                                    | Inserted   | Internal | AS 81935/7       | PHFJ/WAS..                       | WAS..R inch, EWAS..R inch | PHUFJ/XRL..                                                                                                    | 12CF..                                                                                                        | 3.31         | 366  |
|                           |                                                                                    | Inserted   | Internal | AS 81935/9       | PHFJ/NAS..                       | NAS..R inch, ENAS..R inch | PHUFJ/XRE..                                                                                                    | 12CNF..                                                                                                       | 3.32         | 370  |
|                           |                                                                                    | Inserted   | Internal | NSA 8149         | R..F..                           | SW..G inch                | –                                                                                                              | –                                                                                                             | 3.33         | 374  |
|                           |                                                                                    | Inserted   | Internal | –                | EFJ/RL..R                        | WAS..R inch               | –                                                                                                              | –                                                                                                             | 3.34         | 378  |
|                           |                                                                                    | Inserted   | Internal | –                | EFJ/RT..R                        | XRT..R inch               | –                                                                                                              | –                                                                                                             | 3.35         | 380  |

# Self-lubricating journal bearings

Airframe journal bearings are “maintenance-free” and compact solutions that enable low friction rotation and sliding guidance by providing a self-lubricating and wear-resistant surface, while limiting constraints on the assembly when replacement is required.

The SKF journal bearing standard assortment is comprised of plain and flanged bearings.

For more information, see **table 9** for metric bearings, **table 10** for bearings with inch dimensions and refer to *Journal bearings*, **page 390**.



Plain journal bearings



Flanged journal bearings

Table 9

## SKF self-lubricating journal bearings (metric dimensions)

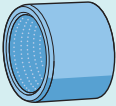
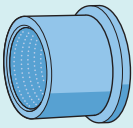
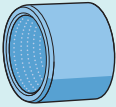
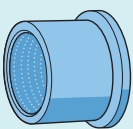
| Shape                                                                                        | Shell material            | Standard | Liner     | SKF series | Table number | Page |
|----------------------------------------------------------------------------------------------|---------------------------|----------|-----------|------------|--------------|------|
| Plain<br>   | Corrosion-resistant steel | EN 2287  | X1        | 13C..Z     | 4.1          | 404  |
|                                                                                              |                           | EN 2287  | Fiberslip | ..K        | 4.1          | 404  |
|                                                                                              |                           | –        | X1        | 13D..Z     | 4.2          | 406  |
|                                                                                              | Aluminium alloy           | EN 2285  | X1        | 13C..Z     | 4.1          | 404  |
|                                                                                              |                           | EN 2285  | Fiberslip | ..K        | 4.1          | 404  |
|                                                                                              |                           | –        | X1        | 13D..Z     | 4.2          | 406  |
| Flanged<br> | Corrosion-resistant steel | EN 2288  | X1        | 13C..F     | 4.3          | 408  |
|                                                                                              |                           | EN 2288  | Fiberslip | ..F..K     | 4.3          | 408  |
|                                                                                              |                           | –        | X1        | 13D..F     | 4.4          | 410  |
|                                                                                              | Aluminium alloy           | EN 2286  | X1        | 13C..F     | 4.3          | 408  |
|                                                                                              |                           | EN 2286  | Fiberslip | ..F..K     | 4.3          | 408  |
|                                                                                              |                           | –        | X1        | 13D..F     | 4.4          | 410  |

Table 10

## SKF self-lubricating journal bearings (inch dimensions)

| Shape                                                                                          | Shell material            | Standard   | Liner     | SKF series | Table number | Page |
|------------------------------------------------------------------------------------------------|---------------------------|------------|-----------|------------|--------------|------|
| Plain<br>   | Corrosion-resistant steel | NSA 8145   | X1        | 13A..Z..   | 4.5          | 412  |
|                                                                                                |                           | NSA 8145   | Fiberslip | K..P       | 4.5          | 412  |
|                                                                                                |                           | AS 81934/1 | X1        | 13B..Z..   | 4.6          | 414  |
|                                                                                                | Aluminium alloy           | EN 4536-2  | X1        | 13E..Z..   | 4.7          | 416  |
|                                                                                                |                           | NSA 8146   | X1        | 13A..Z..   | 4.5          | 412  |
|                                                                                                |                           | NSA 8146   | Fiberslip | K..P       | 4.5          | 412  |
| Flanged<br> | Corrosion-resistant steel | AS 81934/1 | X1        | 13B..Z..   | 4.6          | 414  |
|                                                                                                |                           | EN 4534-2  | X1        | 13E..Z..   | 4.7          | 416  |
|                                                                                                |                           | NSA 8147   | X1        | 13A..Z..   | 4.8          | 418  |
|                                                                                                | Aluminium alloy           | NSA 8147   | Fiberslip | K..F..P    | 4.8          | 418  |
|                                                                                                |                           | AS 81934/2 | X1        | 13B..F..   | 4.9          | 420  |
|                                                                                                |                           | EN 4537-2  | X1        | 13E..F..   | 4.10         | 422  |
|                                                                                                | Aluminium alloy           | NSA 8148   | X1        | 13A..F..   | 4.8          | 418  |
|                                                                                                |                           | NSA 8148   | Fiberslip | K..F..P    | 4.8          | 418  |
|                                                                                                |                           | AS 81934/2 | X1        | 13B..F..   | 4.9          | 420  |
|                                                                                                |                           | EN 4535-2  | X1        | 13E..F..   | 4.10         | 422  |
|                                                                                                |                           |            |           |            |              |      |
|                                                                                                |                           |            |           |            |              |      |



## Airframe standard bearings selection process

If you are looking for a known product, according to its standard for example, or if you are an experienced bearing expert, go directly to the relevant product chapter and product table.

For help in selecting the appropriate bearing type, refer to *Basic bearing type selection guide*, **page 28**, and follow the selection process given for each standard airframe product:

- 1 Determine the relevant bearing type
- 2 Determine the allowable bearing size
- 3 Determine the required bearing load carrying capability
- 4 From the product tables, find a suitable bearing based on the above steps
- 5 Choose all other required options including materials, surface treatments, lubrication, sealing, etc.
- 6 Consider bearing handling requirements for mounting, dismantling and storage

If the standard SKF range of bearings does not meet your specific needs, contact SKF for a customized design solution, as described in *Customized products*.

Refer to the relevant product chapter for more information.

## Customized and engineered bearings

SKF supplies customized and engineered bearings to meet specific airframe application requirements. These solutions are the result of SKF's extensive experience and close cooperation between SKF and the customer's application experts.

SKF provides total solutions over the full bearing life cycle, including design, testing and partnership.

Customized products per bearing type are presented in the individual product sections. Other engineered airframe solutions include:

- Pulleys (**page 428**)
- Needle bearings (**page 436**)
- Composite solutions (**page 438**)

For more information, contact SKF via: [skf.com/go/aero](https://skf.com/go/aero)

# Basic bearing type selection guide

Based on their key characteristics (**table 11**), an initial decision must be made between using a standard SKF Aerospace self-lubricating journal bearing, spherical plain bearing, or rolling bearing.

A

Table 11

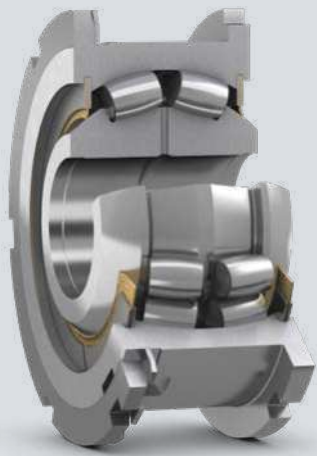
| Basic bearing type selection guide  |                                                                                      |                                                                                  |                                      |                                                              |
|-------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|
| Application requirement             | Rolling bearing                                                                      | Spherical plain bearing                                                          |                                      | Self-lubricating journal bearing                             |
|                                     |                                                                                      | Metal-to-metal                                                                   | Self-lubricating                     |                                                              |
| Load capacity vs compactness        | Good                                                                                 | Very good                                                                        | Very good                            | Excellent                                                    |
| No load starting rotational torque  | Low                                                                                  | Low                                                                              | Moderate                             | Moderate                                                     |
| No load starting swivelling torque  | Low to moderate (for bearings with misalignment capability)                          | Low                                                                              | Moderate                             | N/A                                                          |
| Loaded rotational frictional moment | Very low                                                                             | Moderate                                                                         | Low                                  | Low                                                          |
| Loaded swivelling frictional moment | Low to moderate (for bearings with misalignment capability)                          | Moderate                                                                         | Low                                  | N/A                                                          |
| Lubrication                         | Greased-for-life                                                                     | Greased-for-life or need for relubrication depending on application requirements | Maintenance-free                     | Maintenance-free                                             |
| Typical motion                      | From oscillation > 1° to low number of complete revolutions at low to moderate speed | Oscillation at low speed                                                         | Oscillation at low to moderate speed | Oscillation and/or sliding of shaft at low to moderate speed |
| Typical dynamic failure mode        | Surface failure                                                                      | Progressive wear and seizing                                                     | Progressive wear                     | Progressive wear                                             |

When an attachment and positioning solution to the application is needed, rod ends can be used.

For more information, refer to the relevant product chapter.

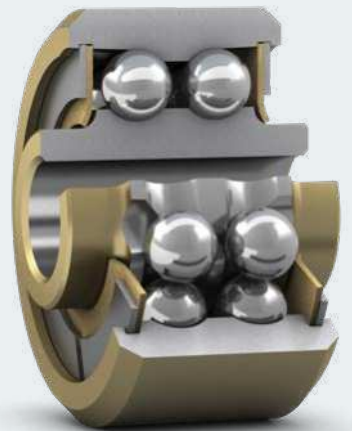
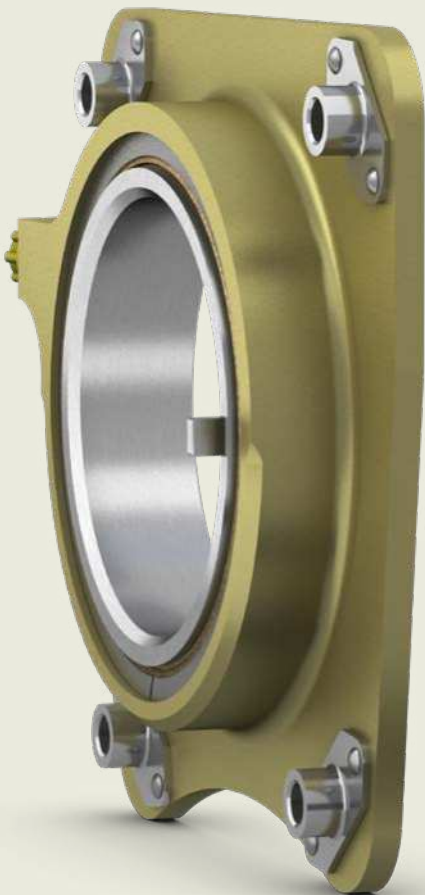
For more solutions, refer to the customized and engineered bearing sections in the relevant product chapter and contact SKF via: [skf.com/go/aero](https://skf.com/go/aero).





1

# Rolling bearings



# 1 Rolling bearings

|                                                                  |           |                                                                                                               |            |
|------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------|------------|
| Bearing designs and variants .....                               | 32        | <b>Product tables</b>                                                                                         |            |
| Variants .....                                                   | 34        | <b>Metric dimensions</b> .....                                                                                | <b>52</b>  |
| Bearing materials .....                                          | 34        | <b>1.1</b> Deep groove ball bearing single row .....                                                          | 52         |
| Surface treatments .....                                         | 34        | <b>1.2</b> Deep groove ball bearing single row, EN 3284,<br>EN 3285, EN 3286, EN 3045, EN 3046, EN 3047 ..... | 54         |
| Sealing and shielding solutions .....                            | 34        | <b>1.3</b> Deep groove ball bearing single row .....                                                          | 56         |
| Rod ends .....                                                   | 34        | <b>1.4</b> Deep groove ball bearing single row, EN 3281,<br>EN 3282, EN 3283, EN 4033 .....                   | 58         |
| Customized bearings .....                                        | 34        | <b>1.6</b> Deep groove ball bearing double row .....                                                          | 60         |
| <b>Rolling bearing selection for airframe applications</b> ..... | <b>35</b> | <b>1.6</b> Deep groove ball bearing double row, EN 3056,<br>EN 3057, EN 3058 .....                            | 62         |
| Performance and operating conditions .....                       | 35        | <b>1.7</b> Deep groove ball bearing with self-aligning ring<br>single row, EN 3059, EN 3060, EN 3061 .....    | 64         |
| Bearing selection process .....                                  | 36        | <b>1.8</b> Deep groove ball bearing with self-aligning ring<br>single row, EN 4041 .....                      | 66         |
| Selecting bearing size and options .....                         | 36        | <b>1.9</b> Self-aligning ball bearing double row, EN 3287,<br>EN 3288, EN 3289 .....                          | 68         |
| Bearing load carrying capability .....                           | 37        | <b>1.10</b> Self-aligning ball bearing double row, EN 4034 .....                                              | 70         |
| Static load .....                                                | 37        | <b>1.11</b> Spherical roller bearing single row, EN 3053,<br>EN 3054, EN 3055 .....                           | 72         |
| Dynamic load rating .....                                        | 38        | <b>1.12</b> Spherical roller bearing single row, EN 3290,<br>EN 3291, EN 3292 .....                           | 74         |
| Lubrication .....                                                | 39        | <b>1.13</b> Spherical roller bearing double row .....                                                         | 76         |
| Operating temperature .....                                      | 40        |                                                                                                               |            |
| Sealing and shielding .....                                      | 40        | <b>Inch dimensions</b> .....                                                                                  | <b>78</b>  |
| Friction and torque .....                                        | 41        | <b>1.14</b> Deep groove ball bearing single row, AS 27640 .....                                               | 78         |
| Bearing interfaces .....                                         | 42        | <b>1.15</b> Deep groove ball bearing single row, AS 27641 .....                                               | 80         |
| Selecting fits .....                                             | 42        | <b>1.16</b> Deep groove ball bearing single row, AS 27642 .....                                               | 84         |
| Axial location of bearing .....                                  | 42        | <b>1.17</b> Deep groove ball bearing single row .....                                                         | 90         |
| Bearing data .....                                               | 45        | <b>1.18</b> Deep groove ball bearing single row, AS 27646,<br>AS 21428 .....                                  | 92         |
| Dimensions and tolerances .....                                  | 45        | <b>1.19</b> Deep groove ball bearing double row .....                                                         | 96         |
| Material .....                                                   | 45        | <b>1.20</b> Deep groove ball bearing double row, AS 27644 .....                                               | 98         |
| Surface treatments .....                                         | 46        | <b>1.21</b> Deep groove ball bearing double row, AS 27647 .....                                               | 100        |
| Sealing and shielding .....                                      | 47        | <b>1.22</b> Deep groove ball bearing with self-aligning ring<br>single row, AS 27648 .....                    | 102        |
| Internal clearance .....                                         | 47        | <b>1.23</b> Self-aligning ball bearing single row, AS 27645 .....                                             | 106        |
| <b>Bearing handling</b> .....                                    | <b>49</b> | <b>1.24</b> Self-aligning ball bearing single row .....                                                       | 110        |
| Mounting .....                                                   | 49        | <b>1.25</b> Self-aligning ball bearing double row .....                                                       | 112        |
| Dismounting .....                                                | 50        | <b>1.26</b> Self-aligning ball bearing double row, AS 27643 .....                                             | 114        |
| Storage .....                                                    | 50        | <b>1.27</b> Spherical roller bearing single row .....                                                         | 116        |
| <b>Customized products</b> .....                                 | <b>51</b> |                                                                                                               |            |
| Legacy standards .....                                           | 51        | <b>Cross-reference</b> .....                                                                                  | <b>118</b> |
|                                                                  |           | Metric bearings .....                                                                                         | 118        |
|                                                                  |           | Inch bearings .....                                                                                           | 124        |

# 1 Rolling bearings

1

Airframe rolling bearings are full complement bearings (i.e. bearings without a cage and with a full complement of rolling elements) that enable rotation with minimal friction.

They support high loads and guide rotating components precisely. Airframe rolling bearings accommodate radial loads (perpendicular to the shaft) and axial loads (along the shaft). They are designed to accommodate oscillating movements or a low number of complete rotations at low rotational speed.

Some bearing types can compensate for misalignment between the shaft and housing bore.

Airframe rolling bearings are used widely in aircraft structures. They can be found in many applications including:

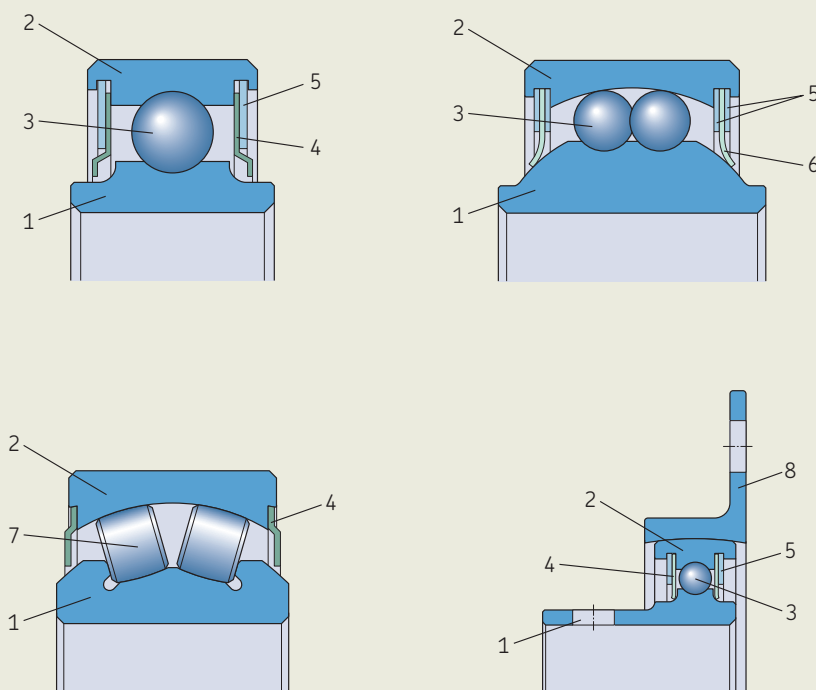
- Flight controls
- Actuators, attachment points and hinges
- Doors
- Helicopter rotors

## Bearing designs and variants

Commonly used airframe rolling bearing types are listed in **table 1** for metric bearings and in **table 2** for bearings with inch dimensions. In addition to this standard assortment, SKF supplies a variety of customized bearings, **page 51**.

Figure 1

### Terminology



- 1 Inner ring
- 2 Outer ring
- 3 Ball(s)
- 4 Shields
- 5 Metal retainers
- 6 Seals
- 7 Roller(s)
- 8 Flange of self-aligning ring

Table 1

## SKF rolling bearings, metric dimensions

| Type                                             |                                                                                    | Number of rows | Standard                             | SKF series                               | Table number | Page     |
|--------------------------------------------------|------------------------------------------------------------------------------------|----------------|--------------------------------------|------------------------------------------|--------------|----------|
| Deep groove ball bearing                         |   | Single         | –                                    | JN..                                     | 1.1          | 52       |
|                                                  |                                                                                    |                | EN 3284, EN 3285, EN 3286            | JNA..                                    | 1.2          | 54       |
|                                                  |                                                                                    |                | EN 3045, EN 3046, EN 3047            | –                                        | 1.3          | 56       |
|                                                  |                                                                                    |                | EN 3281, EN 3282, EN 3283<br>EN 4033 | TA..                                     | 1.4          | 58       |
|                                                  |   | Double         | –                                    | AG..                                     | 1.5          | 60       |
|                                                  |                                                                                    |                | EN 3056, EN 3057, EN 3058            | AGN...                                   | 1.6          | 62       |
| Deep groove ball bearing with self-aligning ring |   | Single         | EN 3059, EN 3060, EN 3061            | TRCE..                                   | 1.7          | 64       |
|                                                  |                                                                                    |                | EN 4041                              | TRCEI..                                  | 1.8          | 66       |
| Self-aligning ball bearing                       |   | Double         | EN 3287, EN 3288, EN 3289<br>EN 4034 | KN..<br>KNRCE..                          | 1.9<br>1.10  | 68<br>70 |
| Spherical roller bearing                         |   | Single         | EN 3053, EN 3054, EN 3055            | K..F, KN..F, K..FE..<br>SP1, KN..FE..SP1 | 1.11         | 72       |
|                                                  |                                                                                    |                | EN 3290, EN 3291, EN 3292            | KNA..F                                   | 1.12         | 74       |
|                                                  |  | Double         | –                                    | K..D                                     | 1.13         | 76       |

Table 2

## SKF rolling bearings, inch dimensions

| Type                                             |                                                                                     | Number of rows | Standard | SKF series                         | Table number | Page |
|--------------------------------------------------|-------------------------------------------------------------------------------------|----------------|----------|------------------------------------|--------------|------|
| Deep groove ball bearing                         |  | Single         | AS 27640 | KP.., KP..L                        | 1.14         | 78   |
|                                                  |                                                                                     |                | AS 27641 | KP..A                              | 1.15         | 80   |
|                                                  |                                                                                     |                | AS 27642 | KP..B                              | 1.16         | 84   |
|                                                  |                                                                                     |                | –        | KP..SP.., KP..A..SP.., KP..L..SP.. | 1.17         | 90   |
|                                                  |  | Double         | AS 27646 | B500..                             | 1.18         | 92   |
|                                                  |                                                                                     |                | AS 21428 | –                                  | 1.19         | 96   |
|                                                  |                                                                                     |                | AS 27644 | DPP..                              | 1.20         | 98   |
|                                                  |                                                                                     |                | AS 27647 | DW.., DW..K2, DW..K                | 1.21         | 100  |
| Deep groove ball bearing with self-aligning ring |  | Single         | AS 27648 | KP..BS                             | 1.22         | 102  |
| Self-aligning ball bearing                       |  | Single         | AS 27645 | KSP.., KSP..A, KSP..L              | 1.23         | 106  |
|                                                  |                                                                                     |                | –        | KSP..SP.., KSP..A..SP..            | 1.24         | 110  |
|                                                  |  | Double         | –        | KN..                               | 1.25         | 112  |
|                                                  |                                                                                     |                | AS 27643 | DSP..                              | 1.26         | 114  |
| Spherical roller bearing                         |  | Single         | –        | DSRP..                             | 1.27         | 116  |

# Variants

## Bearing materials

1

Standard bearing materials are:

- Bearing steel
- Corrosion-resistant steel for enhanced corrosion resistance

SKF also supplies bearings using various other material types and grades.

For additional information and options, refer to *Customized products* **page 51**.

## Surface treatments

Surface treatments are used to adapt bearings to various application requirements, including:

- Enhanced corrosion resistance under specific environmental conditions
- Increased fretting resistance

For additional information and options, refer to *Surface treatments* **page 46**.

## Sealing and shielding solutions

All standard rolling bearings are protected by either a:

- Non-contacting shield
- Contact seal

This is used to protect bearings against the ingress of external contaminants, keep the grease inside the bearing and prolong bearing service life

For additional information, refer to *Sealing and shielding* **page 40**.

# Rod ends

Rolling bearings can be used as part of rod ends, see **figure 2**. Rod ends are used for easy attachment of a bearing to the airframe structure. For information about these products, refer to *Rod Ends* **page 280**.

## Customized bearings

SKF supplies customized bearings to meet specific airframe application requirements. These solutions are the result of SKF's extensive experience and close cooperation between SKF and the customer's application experts

SKF provides total solutions over the full life cycle, including design, testing and partnership.

For additional information, refer to *Customized products* **page 51**.

Contact your regional SKF partner via: [www.skf.com/go/aero](http://www.skf.com/go/aero)



Figure 2. Rod end with integrated self-aligning ball bearing



# Rolling bearing selection for airframe applications

## Performance and operating conditions

The first step in the bearing selection process is to understand and document:

- Required performance
- Operating conditions and any assumptions made
- Any other application prerequisites

### Basic selection criteria

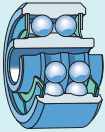
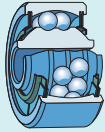
Each bearing type displays specific design characteristics to accommodate a wide range of application conditions. The main factors to consider in order to select the most suitable bearing type based on application requirements are:

- Misalignment capability
- Compactness
- Load carrying capability (magnitude and direction)
- Rotational frictional moment

**Table 3** provides quick guidance for most relevant selection criteria. Definitions are provided on the next page.

1

Table 3

| Bearing types                   |                    | Deep groove ball bearing                                                            |                                                                                     | Self-aligning ball bearing                                                          |                                                                                     | Spherical roller bearing                                                             |                                                                                       | Deep groove ball bearing with self-aligning ring                                      |
|---------------------------------|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                 |                    |  |  |  |  |  |  |  |
| Properties                      |                    | Single row                                                                          | Double row                                                                          | Single row                                                                          | Double row                                                                          | Single row                                                                           | Double row                                                                            | Single row                                                                            |
| Misalignment capability         | Static             | No                                                                                  | No                                                                                  | Good                                                                                | Good                                                                                | Good                                                                                 | Good                                                                                  | Good                                                                                  |
|                                 | Dynamic            | No                                                                                  | No                                                                                  | Good                                                                                | Good                                                                                | Good                                                                                 | Good                                                                                  | No                                                                                    |
| Compactness                     |                    | Excellent                                                                           | Moderately reduced compared to single row                                           | Good                                                                                | Moderately reduced compared to single row                                           | Good                                                                                 | Moderately reduced compared to single row                                             | Very good                                                                             |
| Radial load carrying capability | Static and dynamic | Very good                                                                           | Highly increased compared to single row                                             | Good                                                                                | Highly increased compared to single row                                             | Excellent                                                                            | Highly increased compared to single row                                               | Good (depending on flange geometry)                                                   |
| Axial load carrying capability  | Static             | Good                                                                                | Increased compared to single row                                                    | No                                                                                  | Good                                                                                | Very good                                                                            | Increased compared to single row                                                      | Good                                                                                  |
|                                 | Dynamic            | Good, must be combined with a higher radial load                                    | Increased compared to single row                                                    | No                                                                                  | Good                                                                                | Very good, must be momentary or intermittent and combined with a higher radial load  | Increased compared to single row                                                      | Good, must be combined with a higher radial load                                      |
| Low starting rotational torque  |                    | Excellent                                                                           | Reduced performance compared to single row                                          | Excellent                                                                           | Reduced performance compared to single row                                          | Good                                                                                 | Reduced performance compared to single row                                            | Excellent                                                                             |

For specific application requirements, SKF Application Engineering services are available to support in the bearing selection process, perform complex calculations, and diagnose and solve bearing performance issues.

## Misalignment capability

**Table 3** provides an overview of the capability of various bearing types to accommodate misalignment. The different types of misalignment are explained in **table 4**.

Bearing types vary in their ability to compensate for misalignment between the shaft and housing. Values for the permissible misalignment angles are listed in the relevant product table.

## Compactness

Often the boundary dimensions of a bearing are predetermined by the space available on the aircraft system. Typically, the shaft diameter determines the bearing bore diameter.

The bearing type impacts the size of the bearing. For the same outer diameter, double row bearings typically have larger widths than single row bearings.

## Load carrying capability

All airframe bearings can accommodate radial loads.

Rolling bearings with rollers accommodate higher loads than same size bearings with balls as rolling elements.

Double row bearings accommodate higher loads than single row bearings of the same type.

Deep groove ball bearings are a common choice for applications with moderate axial loads. For higher axial loads spherical roller bearings are recommended.

## Rotational frictional moment

Ball bearings have a lower rotational frictional moment than roller bearings.

The rotational frictional moment can be impacted by the sealing solution, refer to *Sealing and shielding* **page 40**.

# Bearing selection process

## Selecting bearing size and options

If you are looking for a known rolling bearing, according to its standard for example, or if you are an experienced bearing expert, use **table 1** and **2** to find the relevant product table.

For help in selecting the appropriate rolling bearing size and options, follow these steps:

- 1 Determine the suitable bearing type using the selection matrix **table 3**.
- 2 Determine the range of allowable interface dimensions for the bearing. Refer to *Compactness* **page 36**.
- 3 Determine the static radial and axial load requirements, refer to *Bearing load carrying capability* **page 37**.
- 4 From the product tables, find a bearing with sufficient static load carrying capability that best fits the required dimensions.

### Example

When selecting a deep groove ball bearing for a maximum bearing size of 25,4 mm, a minimum shaft size of 6 mm, and a minimum static radial load carrying capability of 11 kN, then a JNA 8 single row deep groove ball bearing can be selected.

- 5 When compensation for misalignment is required, check whether the swivelling angle is sufficient.
- 6 If the bearing is subjected to dynamic loading conditions, refer to *Dynamic load rating* **page 38** in order to select a bearing that will achieve the required dynamic life.

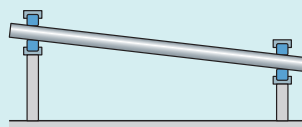
If required, repeat above steps to determine a suitable bearing series and size.

Table 4

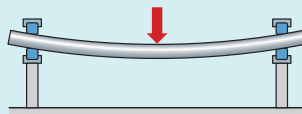
### Types of misalignment

#### Static misalignment

There is an initial alignment error between the two supports of a shaft.

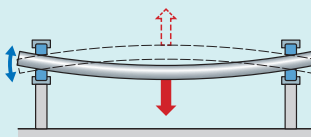


Shaft deflection creates misalignment between bearing inner and outer rings that is constant in magnitude and direction.



#### Dynamic misalignment

Varying shaft deflection creates misalignment between bearing inner and outer rings that is continuously changing in magnitude or direction.



7 Verify other parameters or select suitable bearing variant:

- Select grease and verify operating temperature range. Refer to *Lubrication* page 39 and *Operating temperature* page 40.
- Select sealing or shielding solution. Refer to *Sealing and shielding* page 40.
- Verify starting torque. Refer to *Friction and torque* page 41.
- Verify internal clearances and bearing precision. Refer to *Internal clearance* page 47.
- Select materials and surface treatments. Refer to *Material* page 45 and *Surface treatments* page 46.
- Select fits and axial location conditions based on mating parts information. Refer to *Bearing interfaces* page 42.

If the standard SKF range of rolling bearings does not meet your specific needs, contact SKF for a customized design solution, as described in *Customized products* page 51.

## Bearing load carrying capability

The aircraft loads applied on bearings are either static or dynamic, in the axial or radial direction, or with both axial and radial loads combined, see figure 3.

### Static load

Static load can lead to permanent deformation of the bearing rolling elements or raceways, increased friction, and ultimately failure of the bearing if the applied load is above the bearing static load carrying capability.

It is therefore necessary to select a bearing with sufficiently high static load carrying capability.

### Radial and axial static limit loads ( $C_s$ and $C_a$ )

The radial static limit load,  $C_s$  and axial static limit load,  $C_a$  are defined respectively as the maximum radial and the maximum axial static load carrying capabilities of the bearing. Due to the high loads and oscillating movements, or low number of complete rotations at low rotational speed of airframe bearing applications, a total permanent deformation greater than the total permanent indent caused under  $C_0$  load is acceptable at the most loaded rolling element.  $C_0$  is defined as the basic radial static load which causes a total permanent indent on the raceway of 1/10 000 of the rolling element diameter.

Values for the axial static limit load,  $C_a$  and radial static limit load  $C_s$  are listed in the relevant product tables.

### Radial and axial static ultimate loads

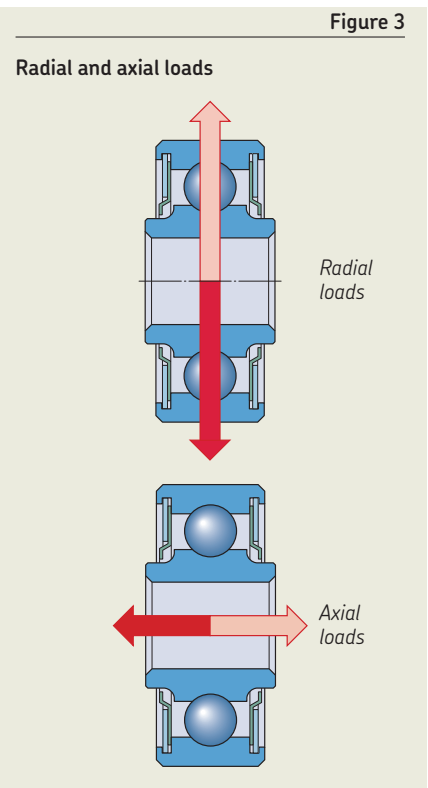
The radial and axial static ultimate loads are defined respectively as the maximum radial and the maximum axial static loads that can be applied on the bearing without causing cracks or failure of the rings or rolling elements.

Static ultimate loads are defined as 1,5 times the static limit loads:

$$\text{Radial static ultimate load} = 1,5 C_s$$

$$\text{Axial static ultimate load} = 1,5 C_a$$

Bearings exposed to this load level are no longer guaranteed to be fully functional and should be replaced.



## Combined loads

As a reminder, single row self-aligning ball bearings are not designed to carry axial loads and should only be subjected to radial loads. Therefore they do not operate under combined axial and radial loading.

If deep groove ball bearings are subjected to combined loads, the operating load must be compared to the axial and radial static limit load carrying capabilities, respectively.

This also applies to deep groove ball bearings with self-aligning ring, where the axial limit load is listed by the relevant product standards for a maximum allowable displacement on the application.

For all other rolling bearing types, when both radial and axial static loads are applied, the equivalent bearing radial static load,  $P_s$  must be determined and compared to the radial static limit load  $C_s$ .

$P_s$  is defined as the equivalent radial static load, constant in magnitude and direction, acting radially on the bearing (**figure 4**).

When applied, the equivalent radial load would have the same influence on the bearing as the actual loads to which the bearing is subjected.

The equivalent load applied to the bearings is defined as:

$$P_s = F_r + Y_s F_a$$

Where

- $P_s$  Equivalent radial static load [lbf/kN]
- $F_r$  Radial component of the applied load [lbf/kN]
- $F_a$  axial component of the applied load [lbf/kN]
- $Y_s$  Axial load factor, depending on bearing type:
  - = 3,2 for double row self-aligning ball bearings
  - = 3,3 for single row spherical roller bearings
  - = 1,6 for double row spherical roller bearings

$P_s$  should be less than or equal to  $C_s$   
e.g.  $P_s \leq C_s$

Where

$C_s$  = Radial static limit load [lbf/kN]

## Dynamic load rating

Airframe bearings can be subjected to duty cycles that are the successive combinations of loads, oscillations or rotations experienced during the different operating conditions of the aircraft.

According to the MIL HDBK 1599 standard (for airframe rolling bearing applications), the dynamic load rating (D.L.r) is defined on the basis of a unidirectional radial load that will result in an average bearing life of 10 000 cycles at  $\theta = 90^\circ$  oscillation (**figure 5**) before evidence of contact fatigue (spalling) occurs. By convention, SKF uses an oscillation angle  $\gamma = \frac{\theta}{2}$  as defined in figure 5.

D.L.r is defined for a load fixed with respect to the inner ring, or to the outer ring.

Contrary to EN product standards, AS product standards define the dynamic load rating that the bearing must sustain. D.L.r values can be found in the relevant product tables.

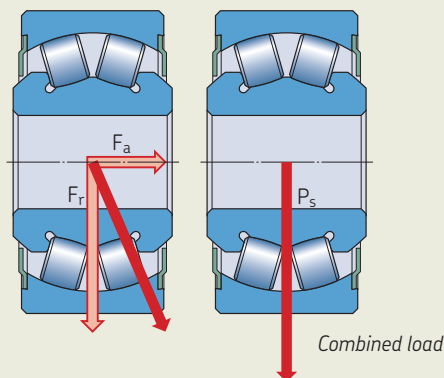
However, in most aerospace applications, the applied dynamic operating load ( $P$ ) differs from the dynamic load rating (D.L.r) for the bearing. It is therefore necessary to evaluate bearing life based on the applied load.

The load-life relationship given **page 39** can be used to calculate an estimation of the bearing life,  $L$  at any load,  $P$ .

Average bearing life,  $L_{50}$  means that 50% of a given group of bearings are expected to achieve the calculated life.

Figure 4

### Combined loads



In cases where higher performance reliability is required,  $L_{10}$  is often used. The  $L_{10}$  life means that, for a given group of bearings, 90% are expected to achieve the duty cycle.

The relationship between  $L_{50}$  and  $L_{10}$  life is 5 to 1. For example, if the  $L_{50}$  life is 10 000 cycles under a given dynamic operating load fixed to a given ring and at a given oscillation angle, then the  $L_{10}$  life is 2 000 cycles.

Load-life relationship:

L Life in cycles

$$L = K \frac{45}{Y} \left( \frac{D.L.r}{P} \right)^{11/3}$$

K Reliability factor = 2 000 for  $L_{10}$   
= 10 000 for  $L_{50}$

Y Oscillation angle [°]

D.L.r Dynamic Load rating [lbf/kN]

P Dynamic operating load or equivalent radial dynamic operating load [lbf/kN]

In the case of combined loads, the equivalent radial dynamic operating load is equal to:

$$P = F_r + Y F_a$$

Where

Y Axial load factor, depending on bearing type:

$$= \frac{C_s}{C_a} \text{ for ball bearings}$$

(Deep groove ball bearings, double row self-aligning ball bearings and deep groove ball bearings with self-aligning ring)

$$= 0 \text{ for single row spherical roller bearings}^1$$

$$= 2,5 \text{ for double row spherical roller bearings}$$

P Equivalent radial dynamic operating load [lbf/kN]

$F_r$  Radial component of the operating dynamic load [lbf/kN]

$F_a$  Axial component of the operating dynamic load [lbf/kN]

## Lubrication

Lubrication is used to:

- Reduce friction
- Reduce wear rate
- Extend bearing service life
- Protect against corrosion
- Block contaminants from entering the bearing

Greases used in SKF bearings are listed in **table 5**. At least 80% of the free space in the bearings is filled with grease. SKF standard bearings are lubricated for life and cannot be relubricated.

Lubrication is primarily chosen according to the operating temperature.

Contact SKF if the operating temperatures are outside the permissible range.

Figure 5

Oscillation angle

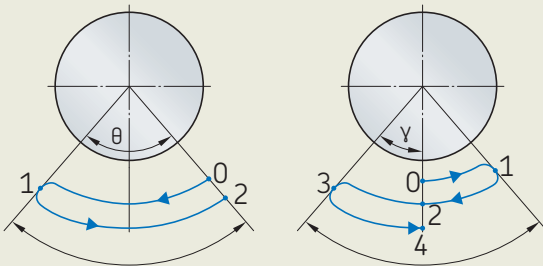


Table 5

Standard greases

| NATO codes | Standard             | Operating temperature               |
|------------|----------------------|-------------------------------------|
| G354       | MIL PRF 23827 type I | -73 to +121 °C<br>(-100 to +250 °F) |
| G395       | MIL PRF 81322        | -54 to +177 °C<br>(-64 to +350 °F)  |

<sup>1)</sup> Single row spherical roller bearings are designed to carry dynamic axial loads,  $F_a$  that are momentary or intermittent and do not exceed 30% of the operating dynamic radial load,  $F_r$ . Therefore, in case of combined load, the equivalent radial dynamic operating load to consider is equal to:  $P = F_r$

# Operating temperature

1

The permissible operating temperature of airframe rolling bearings is typically limited by the grease capability. Refer to *Lubrication* page 39 for more information about grease temperature limits.

## Sealing and shielding

SKF supplies standard bearings with two types of protection:

- Non-contacting shields
- Contact seals

### Bearings with shields

Bearings with shields are used in environments with low levels of contamination and where there is little risk that water or steam for example can come in contact with the bearing.

The shield can be fixed in the outer ring by staking inside a groove or kept in place by a metal retainer (**figure 6**).

### Bearings with seals

Bearings with seals are the preferred solution if:

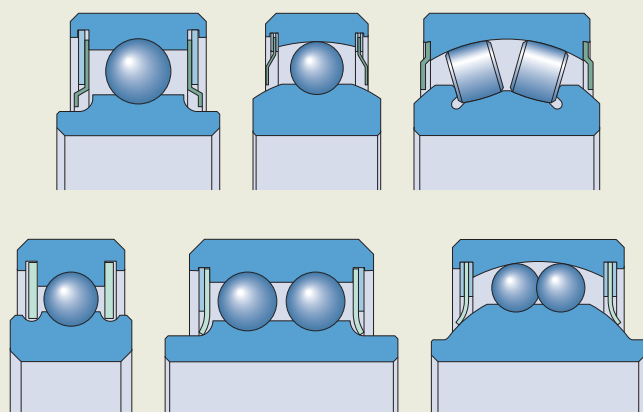
- Contamination is moderate to heavy
- There is a risk of contact with moisture or water spray

The seals protect the bearing against water splashes but they cannot completely stop water from entering the bearing. A metal retainer is used to keep the seal in place in the bearing outer ring (**figure 6**).

The sealing solution can impact bearing torque. For more information, refer to *Friction and torque* page 41.

Figure 6

#### Sealing and shielding variants



# Friction and torque

Two types of frictional moments can be defined for a bearing, rotational frictional moment and swivelling frictional moment (**figure 7**).

The rotational frictional moment is mainly related to the rolling friction of the rolling elements on the raceways.

The swivelling frictional moment for bearings with swivelling capability is mainly related to the sliding friction of the bearing rolling elements on the raceway.

See **figure 8**.

Among other parameters, friction can be influenced by lubrication (refer to *Lubrication* **page 39**), bearing internal clearance (refer to *Bearing interfaces* **page 42**), bearing fits (refer to *Bearing fits* **page 42**), and sealing (refer to *Sealing and shielding* **page 40** and *Seal friction* **page 41**).

## Rotational frictional moment

The rotational frictional moment is not constant. The starting torque is higher than the bearing rolling frictional moment. This is due to the initial resistance to rotation that the bearing has to overcome before increasing the speed of the rolling elements (**diagram 1**).

For airframe rolling bearings, performing oscillation movements or a low number of complete rotations, the starting torque is a relevant design parameter.

## Starting torque

The starting torque is defined as the maximum torque required to start the rotation of the outer ring with the inner ring held stationary. This torque is measured without load applied on the bearing. The maximum starting torque can be found in the relevant product tables. The starting torque of self-aligning bearings is independent of misalignment.

## Seal friction

The starting torque is increased by the contact pressure between the seal and the inner ring of the bearing. The torque values listed in the relevant product tables include this effect.

## Swivelling frictional moment

For self-aligning ball bearings, spherical roller bearings, and deep groove ball bearings with a self-aligning ring, swivelling creates sliding friction. The resulting swivelling frictional moment is higher than the rotational frictional moment.

Swivelling frictional moment values are listed in the relevant product tables.

1

Diagram 1

### Rotational frictional moment

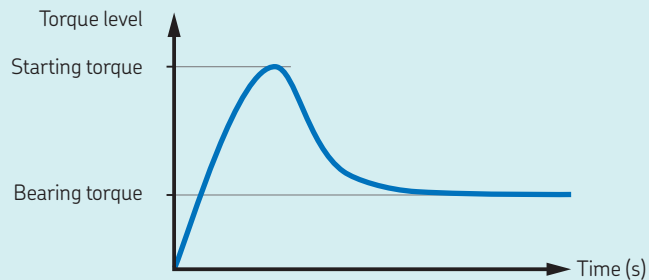


Figure 7

### Bearing torque

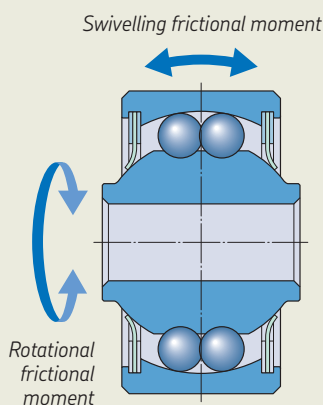
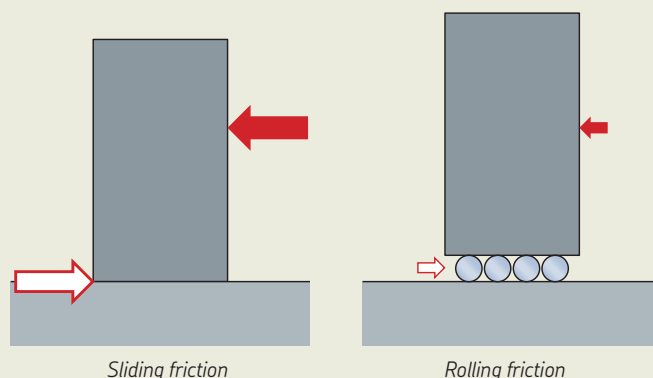


Figure 8

### Bearing friction



# Bearing interfaces

## Selecting fits

1

For the bearing to function properly, its rings must be fully supported and mounted with an appropriate fit on the shaft and in the housing.

In general, airframe rolling bearings are mounted with a loose fit on the shaft and an interference fit in the housing but other housing fits can also be used depending on the application requirements. Refer to **table 8** for recommendations.

For deep groove ball bearings with self-aligning ring, refer to *Flanged units with positioning holes* **page 44** for fitting recommendations.

**NOTE:** The mounting fit can reduce the bearing radial internal clearance and increase the rotational frictional moment. Care must be taken to properly choose the right combination of fit and radial internal clearance to ensure proper function of the bearing. Refer to **table 8** for recommendations.

Clearance values are listed in the relevant product tables. For more information, refer to *Internal clearance* **page 47**.

In the case of interference fit by pairing, care must be taken to follow the specific housing tolerances for each bearing type, see **tables 6 and 7**.

Bearing fit can be impacted by differing coefficients of thermal expansion between the bearing and the housing and shaft materials. This effect must be considered in order to select the appropriate bearing mounting condition.

## Axial location of bearing

When bearings are subjected to axial loads, it is not sufficient to use an interference fit alone to axially locate the bearing in a cylindrical housing bore. Common ways of locating bearing rings axially in a housing bore are by staking or using flanges.

### Staking

To axially locate the bearing, the housing is generally staked onto the bearing's outer ring. Staking is a plastic deformation of the housing clamping the bearing. This axially locates the bearing, while not damaging the bearing ring, typically made of harder material than the housing.

This operation can be done either by point (also referred to as staking by ball) or by notch staking at multiple points around the circumference of the housing's bore diameter. See **figure 9**.

Figure 9. Staking

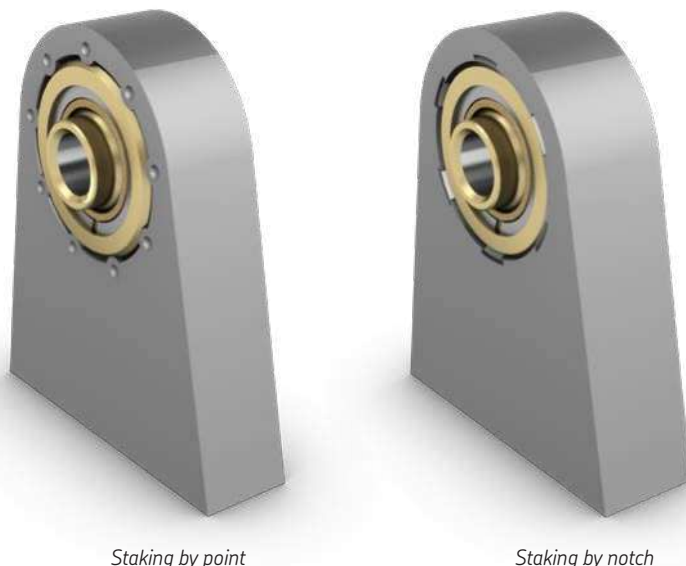




Table 6

Housing interference for deep groove ball bearings

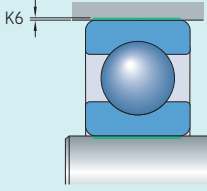
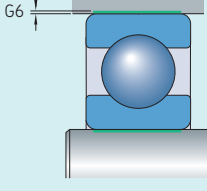
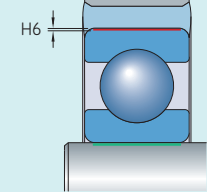
| D  | > | ≤  | Light alloy housing |                     | Steel housing      |                     |
|----|---|----|---------------------|---------------------|--------------------|---------------------|
|    |   |    | Light interference  | Normal interference | Light interference | Normal interference |
| mm |   |    | μm                  |                     |                    |                     |
| 16 |   | 24 | 4–8                 | 8–12                | 2–6                | 5–9                 |
| 24 |   | 32 | 8–12                | 12–16               | 4–8                | 8–12                |
| 32 |   | 48 | 10–14               | 14–18               | 6–10               | 10–14               |
| 48 |   | 78 | 12–16               | 16–20               | 7–11               | 11–15               |
| 78 |   |    | 14–18               | 18–22               | 9–13               | 13–17               |

Table 7

Housing interference for self-aligning ball bearings and spherical roller bearings

| D  | > | ≤  | Light alloy housing |                     | Steel housing      |                     |
|----|---|----|---------------------|---------------------|--------------------|---------------------|
|    |   |    | Light interference  | Normal interference | Light interference | Normal interference |
| mm |   |    | μm                  |                     |                    |                     |
| 16 |   | 24 | 2–6                 | 5–9                 | 1–5                | 3–7                 |
| 24 |   | 32 | 4–8                 | 8–12                | 2–6                | 5–9                 |
| 32 |   | 48 | 6–10                | 10–14               | 3–7                | 6–10                |
| 48 |   |    | 7–11                | 11–15               | 5–9                | 8–12                |

Table 8

| Mounting conditions                    |                                                                                                                              | Recommended bearing clearance |                    | Comments                                        |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------|-------------------------------------------------|
|                                        |                                                                                                                              | Metric                        | Inch               |                                                 |
| Interference fit by pairing (matching) | <b>Table 6</b> for deep groove ball bearings<br><b>Table 7</b> for self-aligning ball bearings and spherical roller bearings | Increased clearance           | Standard clearance | Internal clearance reduction accurately managed |
| Transition fit                         |                                           | Standard clearance            | Reduced clearance  | Low to moderate internal clearance reduction    |
| Loose fit with adhesive bonding        |                                           | Reduced clearance             | Reduced clearance  | No impact on internal clearance                 |
| Mounting in staked bush                |                                           | All bearings                  | All bearings       | Moderate internal clearance reduction           |

## Flanged units with positioning holes

The flanged units (such as deep groove ball bearings with self-aligning ring) incorporate deep groove ball bearings with a spherically shaped outside diameter integrated into a flanged housing featuring positioning holes, see **figure 11**. This assembly facilitates the mounting by allowing for the bearing to be located by bolting the flange positioning holes directly onto the aircraft structure.

If the bearing is oriented inside the housing, it should be mounted with a loose fit, see **Figure 10**.

For mounting into a particular application, SKF can provide support to design a suitable flange shape.

## Flanged bearing

A flanged outer ring is a good solution to locate the bearing axially in one direction, see **figure 12**. The aircraft system must also provide a locating solution in order to retain the bearing when subjected to an axial load in the direction not retained by the flange.

The standard KNRCE series uses this design.

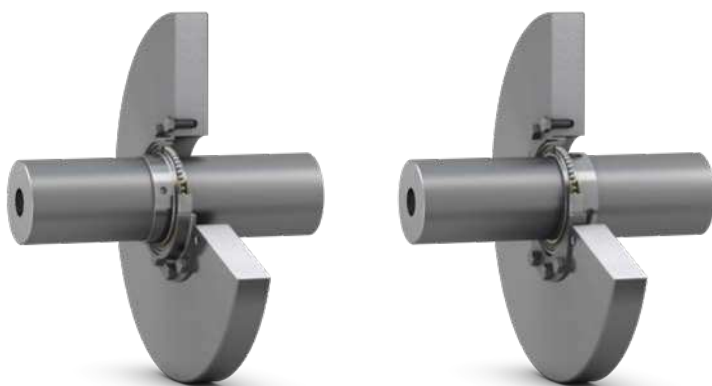


Figure 10

### Locating flanged units with positioning holes

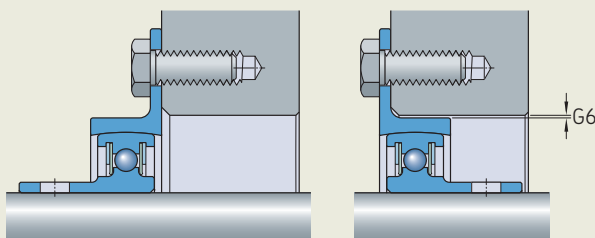


Figure 11

### Flanged units



Figure 12

### Flanged bearing



# Bearing data

## Dimensions and tolerances

Relevant interface dimensions and tolerances are listed in the product tables.

Where

$\Delta d_{mp}$  = Single plane mean bore diameter deviation

$\Delta D_{mp}$  = Single plane mean outside diameter deviation

**Figure 13, top figure** shows the measurement definition for a single plane mean diameter deviation.

And

$\Delta d_s$  = Deviation of a single outside bore diameter

$\Delta D_s$  = Deviation of a single outside diameter

**Figure 13, bottom figure** shows the measurement definition for the deviation of a single diameter.

Relevant geometrical tolerances are listed in the product tables.

Where

$K_{ia}$  = Radial run-out of assembled bearing inner ring

$K_{ea}$  = Radial run-out of assembled bearing outer ring

$S_{ia}$  = Inner ring side run-out with raceway

$S_{ea}$  = Outer ring side run-out with raceway

**Figure 14** shows the measurement definition for the bearing run-outs.

For more information, refer to ISO 1132 (Rolling bearings – tolerances).

## Material

### Bearing rings and rolling elements

For the material of bearing rings and rolling elements, the main selection criteria are corrosion resistance and material hardness.

**Table 9** gives the different designations, reference standards and key characteristics of bearing steels used for SKF rolling bearings.

In addition to **Table 9** SKF can propose a wide variety of materials to meet specific application requirements. For more information, refer to *Customized products* **page 51**.

Airframe rolling bearings can use SKF Aerospace precision specialty balls. As a leading manufacturer of precision specialty balls, SKF provides:

- A wide range of dimensions, with diameters from 0,7 to 64 mm (0.027 to 2.52 inch)
- A wide range of tolerances from ABMA<sup>1)</sup> or ISO grade 3 to 48
- A wide range of materials, typically the same material as rings is used (refer to **table 9** for *standard materials*, and *Customized products* **page 51** for specific materials).

<sup>1)</sup> ABMA is American Bearing Manufacturers Association standards

Figure 13

### Dimensional tolerances measurement principle

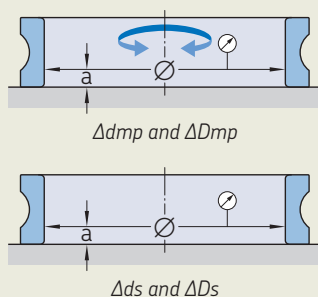
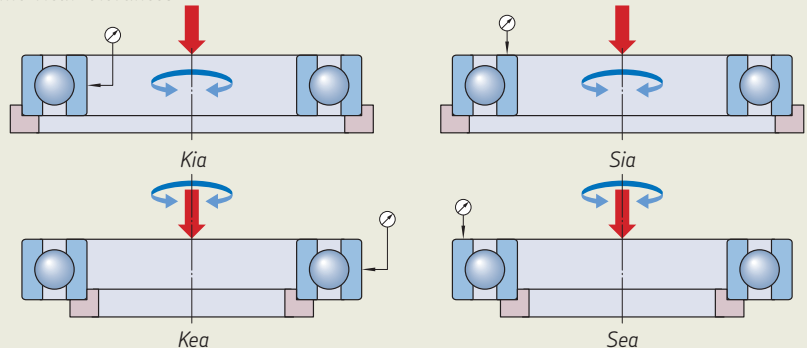


Figure 14

### Geometrical tolerances



## Flange of deep groove ball bearings with self-aligning ring

The flange of deep groove ball bearings with self-aligning ring has a spherical contact with the bearing outer ring and is not exposed to rolling element contact pressure. Materials similar to those for spherical plain bearings are typically selected for the flange. Refer to *Spherical plain bearings – Materials* **page 138** for more information. Standard materials are listed in **table 10**.

## Surface treatments

In application, rolling bearings can be exposed to various environmental conditions including humidity, heat and fluids. These can limit the bearing life or performance by increasing the risk of contamination and corrosion.

Therefore, SKF provides surface treatments for increased general corrosion resistance and increased fretting resistance. Surface treatments are applied to ring surfaces, except on raceways, on the spherical surface of the flange of bearings with self-aligning ring and on the bore of the inner ring.

The standard treatment options are zinc-nickel or cadmium plating.

- Cadmium plating is applied according to AMS QQP416. It is carried out with or without a chromate treatment following the chosen standard. This treatment can include chromium 6 compounds and may be subject to environmental legislation.
- Zinc-nickel plating is a chromium 6 free alternative to cadmium plating, compliant to environmental legislation. Zinc-nickel is applied in accordance with AMS 2417.

Corrosion-resistant steel inner rings can also be passivated according to AMS 2700 or ISO 8075, as required per the relevant standards.

The bearing interface dimensions and tolerances from product tables are not modified when surface treatments are used.

SKF can supply other kinds of surface treatments for specific purposes. Refer to *Customized products* **page 51**.

Table 9

### Standard materials for bearing rings and rolling elements

| Steel type                | Corrosion resistance | Hardness HRC                                           | Material designation | EN standards | AMS standards           | Equivalent designation   |
|---------------------------|----------------------|--------------------------------------------------------|----------------------|--------------|-------------------------|--------------------------|
| Bearing steel             | Moderate             | Metric bearings : 59 to 64<br>Inch bearings : 60 to 66 | 52100                | EN 2031      | AMS 6440 or<br>AMS 6444 | 100Cr6<br>(100C6)        |
| Corrosion-resistant steel | Good                 | ≥ 58 <sup>1)</sup>                                     | 440C                 | EN 2030      | AMS 5630 or<br>AMS 5618 | X105CrMo17<br>(Z100CD17) |

<sup>1)</sup> For inner rings with fixing holes,  
Hardness on the side with raceway ≥ 58 HRC  
Hardness on the side with fixing holes 20 to 30 HRC

Table 10

### Standard materials for flanges of deep groove ball bearings with self-aligning ring

| Steel type                | Corrosion resistance | Material designation | EN standards | AMS standards           | Equivalent designation |
|---------------------------|----------------------|----------------------|--------------|-------------------------|------------------------|
| Stainless steel           | Very good            | 17-4PH H1150         | EN 2539      | AMS 5643                | Z6CNU17.04 H1150       |
| Bearing steel             | Moderate             | 52100                | EN 2031      | AMS 6440 or<br>AMS 6444 | 100Cr6<br>(100C6)      |
| Corrosion-resistant steel | Good                 | 431                  | EN 3490      | AMS 5628                | Z15CN17.03             |
| Alloy steel               | Moderate             | 15CDV6               | EN 2249      | N/A                     | -                      |

## Sealing and shielding

### Seals

Seals used in SKF bearings are typically made of a PTFE compound with or without glass fibre reinforcement:

- Deep-groove ball bearings and deep groove ball bearings with self-aligning ring use a PTFE (Polytetrafluoroethylene) compound (**figure 15**).
- Self-aligning ball bearings and spherical roller bearings use a PTFE compound reinforced with glass fibres. This provides better resistance when swivelling (**figure 15**).

### Shields

Depending on bearing series design the shielding can be made using a metallic shield (generally made of stainless steel or light alloy steel) or a non-metallic shield (generally made of the same material used for seals, see **figure 15**).

### Metal retainers

Metal retainers for seals and shields are made of stainless steel.

## Internal clearance

Bearing internal clearance is defined as the total distance through which one bearing ring can be moved in relation to the other under a defined measuring load according to the relevant standard (**figure 17**). It can be measured in the radial direction (radial internal clearance) or in the axial direction (axial internal clearance).

Diagonal internal clearance for double row deep groove ball bearings is defined as the misalignment that can be measured between the shaft and the outer ring. See **figure 16**.

Clearance values are listed in the relevant product tables.



Figure 15. Seal materials

Seal material using PTFE compound

Seal material using a PTFE compound reinforced with glass fibres

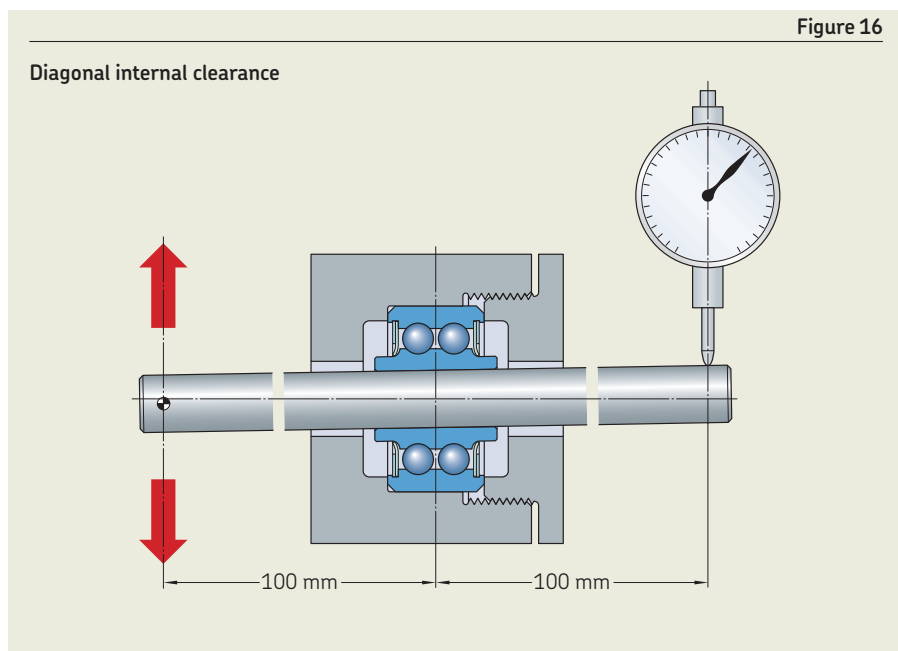


Figure 16

Diagonal internal clearance

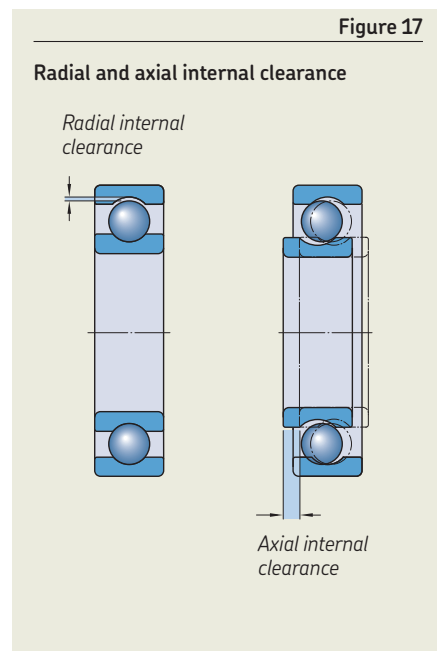


Figure 17

Radial and axial internal clearance

Radial internal clearance

Axial internal clearance

## Increased internal clearance for metric bearings

The standard internal clearance of inch standard bearings is larger than the standard internal clearance of metric standard bearings. To attain values similar to inch size bearings, metric bearings with increased internal clearance can be used.

The values of increased internal clearance for metric bearings, are listed in the relevant product tables.

## Precision bearings

Precision bearings offer reduced dimensional tolerances (bore, outside diameter and width) and geometrical tolerances (radial and axial run-out). The tolerances are listed in the relevant product tables.

As well as reduced dimensional and geometrical tolerances, the inch precision bearings have reduced radial clearances. For more information, refer to the relevant product tables.

Other clearances can be supplied, refer to *Customized products* **page 51**.

## Operating clearance

In most applications, the initial internal clearance in a bearing is greater than its operating clearance. This is due to the effects of:

- Mounting conditions: For example, an interference fit with the housing can reduce the bearing internal clearance (**figure 18**)
- Operating temperature conditions: Thermal expansion of the bearing rings and associated components can lead to dimensional changes and impact the bearing internal clearance (**figure 19**)

These effects must be considered when selecting the initial internal clearance.

Bearings must have an appropriate operating clearance to operate correctly. Ball bearings require an operating clearance that is positive and close to zero. Roller bearings require some small operating clearance.

Figure 18

### Bearing operating clearance

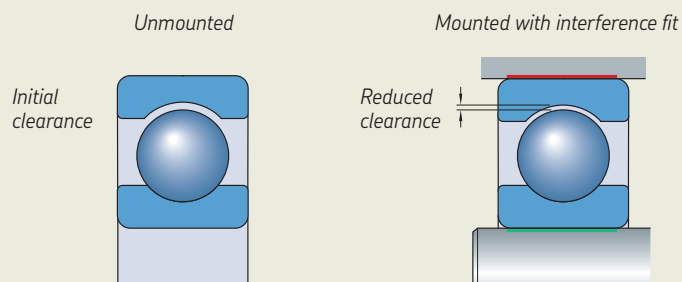
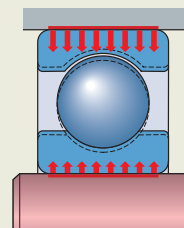


Figure 19

### Influence of temperature on bearing internal clearance



# Bearing handling

Rolling bearings are reliable parts that can provide long service life, if handled and mounted properly. Proper mounting requires experience, accuracy, a clean bearing, housing and shaft, appropriate tools and a clean work environment.

The information provided in the following section is intended to indicate what must be considered to facilitate bearing mounting and dismounting.

**NOTE:** For the purpose of bearing replacement, SKF provides oversized bearings. For more information, refer to *Dismounting* page 50.

## Mounting

The shaft and housing should be chamfered to facilitate bearing mounting. It is important that bearings do not receive direct shocks. The mounting force must never be applied through the rolling elements, but should be applied evenly distributed on the ring to prevent the bearing from tilting or skewing (**figure 21 and 22**).

A typical mounting tool is shown in **figure 20**. Refer to the SKF catalogue "Bearing fitting tool" for more details.

[https://www.skf.com/binary/30-81444/13073EN\\_TMFTseries.pdf](https://www.skf.com/binary/30-81444/13073EN_TMFTseries.pdf)

After mounting, a visual inspection should show no alteration of the bearing. The bearing should turn freely when rotated by hand and feel smooth, with no tight spots, as defined in the relevant technical standards.

1

Figure 21

### Bearing mounting on shaft

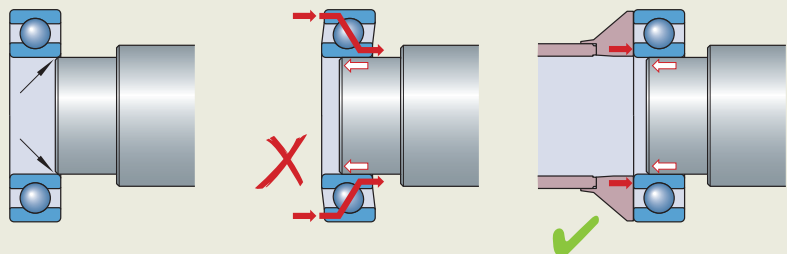


Figure 20

### Mounting tool

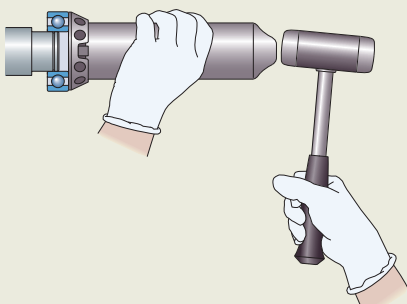
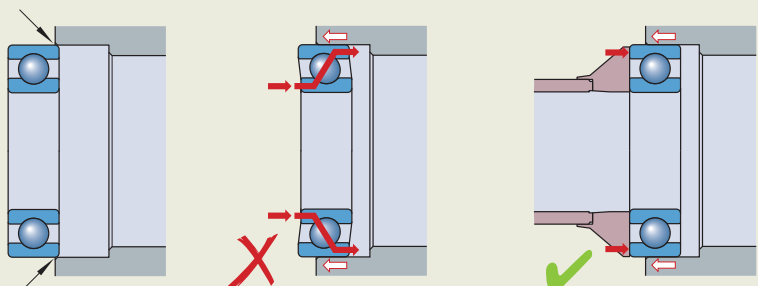


Figure 22

### Bearing mounting in housing



## Dismounting

Dismount rolling bearings by applying a force on the outer ring, or on the inner ring (after removal of the shaft which is typically mounted with clearance, refer to *Selecting fits* page 42).

A typical dismounting tool is shown in **figure 23**. Refer to the SKF bearing dismounting tool catalogue for more details. <https://www.skf.com/binary/21-163650/03000EN.pdf>

A dismounted bearing should not be reused. SKF supplies oversized bearings in a range of increments to allow for reuse of existing housings. See oversized options in the relevant product tables.

## Storage

The performance of bearings, seals and lubricants can be impacted by the bearing storage conditions and time in inventory. SKF recommends a “first in, first out” inventory policy and that the bearings are stored under the storage conditions and storage time specified as follows.

### Storage conditions

To maintain the integrity of the product during storage, SKF recommends the following basic storage practices:

- Store bearings flat, in a vibration-free, dry area with a cool, steady temperature between 15 °C and 35 °C (*between 54 °F and 95 °F*)
- Control and limit the relative humidity of the storage area between 50 and 70%
- Keep bearings in their original individual unopened and undamaged packaging until immediately prior to mounting in application to prevent the ingress of contaminants and corrosion

For storage outside these conditions, the given storage life is not guaranteed. Contact SKF for more information.

### Storage time

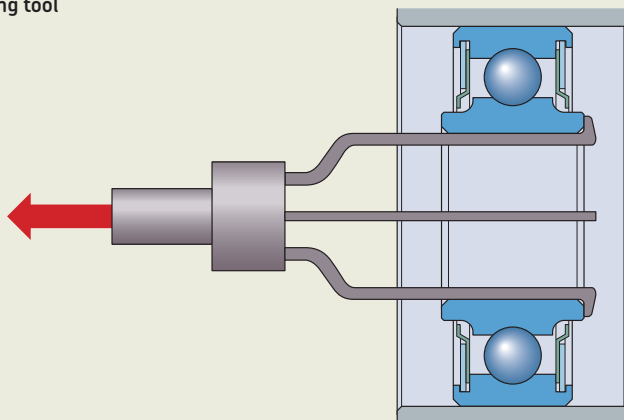
The maximum recommended storage time for SKF standard bearings is five years (starting from the date indicated on SKF's packaging).

Beyond this limit, the ageing of grease and degradation of grease properties can lead to a reduction of bearing performance.

Therefore, after five years of storage, the grease in the bearing must be replaced by SKF.

Figure 23

Dismounting tool





# Customized products

Examples can include, but are not limited to:

- **Specific dimensions, clearances and geometries**
- **Materials**
  - Alternative steels,
  - Corrosion-resistant high nitrogen steel materials (CREN) for enhanced corrosion and mechanical resistance,
  - Case hardening steel materials with a soft core and hard surface, providing increased mechanical resistance.
  - M50 precision specialty ball materials for increased mechanical resistance, increased corrosion resistance, and/or use in high temperature application. M50-NiL materials can also be used for further increased mechanical resistance.
  - Ceramic balls and materials for high temperatures and/or when lubrication is not possible

- **Lubricants**
- **Surface treatments**

Including:

- Nitriding
- Silver plating
- Chemical passivation
- PVD

Certain treatments include chromium 6 compounds and may be subject to environmental legislation

## Legacy standards

SKF can supply bearings compliant to the following legacy standards:

- EN 2009, EN 2010 and EN 2011
- EN 2012, EN 2013 and EN 2014
- EN 2015, EN 2016 and EN 2017
- EN 2018, EN 2019 and EN 2020

1

### Function Typical SKF solutions

#### Mounting solutions



*Flange, nut and washer*



*Holed flange  
Mounted centred or not*



*Staking groove  
on outer ring*

#### Space and weight saving



*Integrated axle*



#### Relubrication



*Lubrication holes  
and grease nipple*



*Lubrication grooves  
(in inner or outer ring)*

Airframe rolling bearings with cage can be supplied and are typically used for pulley applications, including:

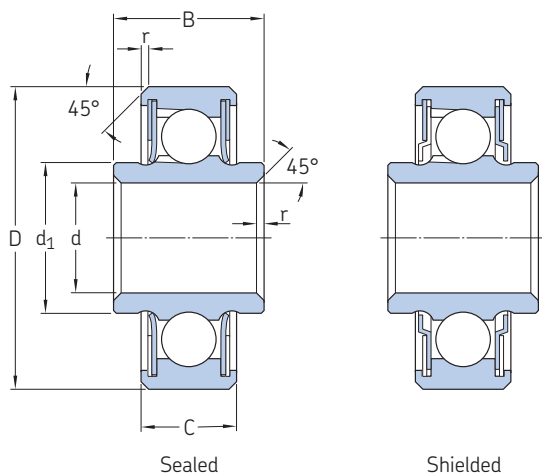
- JN..C and AP.. metric, EN 3182 and EN 3629
- JN..C, P..K, PD..K and AP.. inch, AS 21443

Refer to the *Engineered pulleys* in chapter 5.

## 1.1 Deep groove ball bearing single row (metric dimensions)

JN..

Technical specification –  
Product standard –



### Dimensions and tolerances

| Nominal bore code | Dimensions |                 |              | D  | $\Delta D_{mp}$ | $\Delta D_s$ | C  | B  | $d_1$     | r       | Mass | Tolerances |           |
|-------------------|------------|-----------------|--------------|----|-----------------|--------------|----|----|-----------|---------|------|------------|-----------|
|                   | d          | $\Delta d_{mp}$ | $\Delta d_s$ |    |                 |              |    |    |           |         |      | Kia max    | Precision |
| –                 | mm         | $\mu m$         |              | mm | $\mu m$         |              | mm | mm | $\approx$ |         | g    | $\mu m$    |           |
| 5                 | 5          | 0/-8            | +2/-10       | 16 | 0/-8            | +2/-10       | 5  | 7  | 7,1       | 0,3/0,8 | 4    | 25         | 6         |
| 6                 | 6          | 0/-8            | +2/-10       | 19 | 0/-9            | +2/-11       | 6  | 8  | 8,2       | 0,3/0,8 | 9    | 25         | 6         |
| 8                 | 8          | 0/-8            | +2/-10       | 22 | 0/-9            | +2/-11       | 7  | 11 | 10,6      | 0,3/0,8 | 13   | 25         | 6         |
| 10                | 10         | 0/-8            | +2/-10       | 26 | 0/-9            | +2/-11       | 8  | 12 | 12,6      | 0,3/0,8 | 23   | 25         | 6         |
| 12                | 12         | 0/-8            | +3/-11       | 28 | 0/-9            | +3/-11       | 8  | 12 | 14,7      | 0,3/0,8 | 26   | 25         | 7         |
| 15                | 15         | 0/-8            | +3/-11       | 32 | 0/-11           | +3/-14       | 9  | 13 | 17,7      | 0,3/0,8 | 35   | 25         | 7         |
| 17                | 17         | 0/-8            | +3/-11       | 35 | 0/-11           | +3/-14       | 10 | 14 | 20,2      | 0,3/0,8 | 45   | 25         | 7         |
| 20                | 20         | 0/-10           | +3/-13       | 42 | 0/-11           | +3/-14       | 12 | 16 | 23,5      | 0,3/0,8 | 75   | 25         | 8         |
| 25                | 25         | 0/-10           | +3/-13       | 47 | 0/-11           | +3/-14       | 12 | 16 | 28,6      | 0,3/0,8 | 88   | 25         | 8         |
| 30                | 30         | 0/-10           | +3/-13       | 55 | 0/-13           | +4/-17       | 13 | 19 | 34,1      | 0,3/1   | 133  | 25         | 8         |

### Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances |           | Sia max  |           | Sea max  |           | Static limit loads |             | Clearance |           | Maximum starting torque |        |
|-------------------|------------|-----------|----------|-----------|----------|-----------|--------------------|-------------|-----------|-----------|-------------------------|--------|
|                   | Kia max    | Precision | Standard | Precision | Standard | Precision | Radial $C_s$       | Axial $C_a$ | Standard  | Increased | Shielded                | Sealed |
| –                 | $\mu m$    |           |          |           |          |           | kN                 |             | $\mu m$   |           | mNm                     |        |
| 5                 | 40         | 8         | 40       | 15        | 40       | 20        | 6,9                | 3,1         | 2/9       | 7/15      | 2                       | 4      |
| 6                 | 40         | 10        | 40       | 15        | 40       | 20        | 9,8                | 4,4         | 2/9       | 7/15      | 2,5                     | 5      |
| 8                 | 40         | 10        | 40       | 15        | 40       | 20        | 12                 | 5,4         | 3/11      | 7/15      | 3                       | 5      |
| 10                | 40         | 10        | 40       | 15        | 40       | 20        | 17,2               | 7,8         | 3/11      | 7/15      | 4                       | 6      |
| 12                | 40         | 10        | 40       | 15        | 40       | 20        | 20,2               | 9,2         | 3/11      | 7/15      | 5                       | 7      |
| 15                | 40         | 10        | 40       | 15        | 40       | 20        | 23,5               | 10,7        | 3/11      | 7/15      | 6                       | 8      |
| 17                | 40         | 10        | 40       | 15        | 40       | 20        | 26,9               | 12,2        | 3/11      | 7/15      | 8                       | 11     |
| 20                | 40         | 10        | 40       | 20        | 40       | 20        | 41,5               | 18,8        | 5/13      | 7/15      | 11                      | 14     |
| 25                | 40         | 10        | 40       | 20        | 40       | 20        | 49                 | 22,3        | 5/13      | 7/15      | 13                      | 17     |
| 30                | 40         | 10        | 40       | 20        | 40       | 20        | 62,9               | 28,0        | 5/13      | 7/15      | 19                      | 24     |

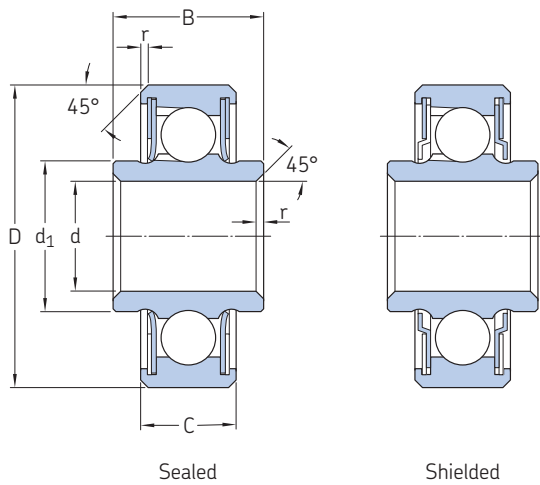
## Designation system

|                          |                                      |   |   |    |    |   |   |       |     |      |     |
|--------------------------|--------------------------------------|---|---|----|----|---|---|-------|-----|------|-----|
| Examples:                | ZWJN20EDJ7-15G81CP55R10              | Z | W | JN | 20 | E | D | J7-15 | G81 | CP55 | R10 |
|                          | JN 5                                 |   |   |    |    |   |   |       |     |      |     |
| <b>Surface treatment</b> |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Not plated steel                     |   |   |    |    |   |   |       |     |      |     |
| Z                        | Cadmium plated steel                 |   |   |    |    |   |   |       |     |      |     |
| SZ                       | Zinc-nickel plated steel             |   |   |    |    |   |   |       |     |      |     |
| <b>Material</b>          |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Bearing steel                        |   |   |    |    |   |   |       |     |      |     |
| W                        | Corrosion-resistant steel            |   |   |    |    |   |   |       |     |      |     |
| <b>Basic designation</b> |                                      |   |   |    |    |   |   |       |     |      |     |
| <b>Bore code</b>         |                                      |   |   |    |    |   |   |       |     |      |     |
| <b>Shield and seal</b>   |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Shielded                             |   |   |    |    |   |   |       |     |      |     |
| E                        | Sealed                               |   |   |    |    |   |   |       |     |      |     |
| <b>Tolerances</b>        |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Standard                             |   |   |    |    |   |   |       |     |      |     |
| D                        | Precision                            |   |   |    |    |   |   |       |     |      |     |
| <b>Radial clearance</b>  |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Standard clearance                   |   |   |    |    |   |   |       |     |      |     |
| J7-15                    | Increased clearance                  |   |   |    |    |   |   |       |     |      |     |
| <b>Lubrication</b>       |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Grease G354                          |   |   |    |    |   |   |       |     |      |     |
| G81                      | Grease G395                          |   |   |    |    |   |   |       |     |      |     |
| <b>Passivation</b>       |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Not treated                          |   |   |    |    |   |   |       |     |      |     |
| CP55 <sup>1)</sup>       | Passivated corrosion-resistant steel |   |   |    |    |   |   |       |     |      |     |
| <b>Oversize</b>          |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Standard outer diameter size         |   |   |    |    |   |   |       |     |      |     |
| R10                      | 0,1 mm oversized outer diameter      |   |   |    |    |   |   |       |     |      |     |
| R20                      | 0,2 mm oversized outer diameter      |   |   |    |    |   |   |       |     |      |     |

<sup>1)</sup> Available only for corrosion-resistant steel material without other surface treatment

## 1.2 Deep groove ball bearing single row (metric dimensions)

JNA..



### Technical specification

EN 3280

### Product standard

Standard tolerances and clearances:

EN 3284 (Bearing steel)  
EN 3285 (Bearing steel  
cadmium plated)  
EN 3286 (Corrosion-  
resistant steel)

Precision tolerances and reduced clearances:

EN 3045 (Bearing steel)  
EN 3046 (Bearing steel  
cadmium plated)  
EN 3047 (Corrosion-  
resistant steel)

### Dimensions and tolerances

| Nominal<br>bore<br>code | Dimensions |                 |              | D  | $\Delta D_{mp}$ | $\Delta D_s$ | C  | B  | $d_1$ | r       | Mass<br>≈ | Tolerances |           |         |           |
|-------------------------|------------|-----------------|--------------|----|-----------------|--------------|----|----|-------|---------|-----------|------------|-----------|---------|-----------|
|                         | d          | $\Delta d_{mp}$ | $\Delta d_s$ |    |                 |              |    |    |       |         |           | Kia max    | Precision | Kea max | Precision |
| –                       | mm         | μm              |              | mm | μm              |              | mm | mm | mm    |         | g         | μm         |           |         |           |
| 5                       | 5          | 0/-8            | +2/-10       | 16 | 0/-8            | +2/-10       | 5  | 7  | 7,6   | 0,3/0,8 | 4         | 25         | 6         | 40      | 8         |
| 6                       | 6          | 0/-8            | +2/-10       | 19 | 0/-9            | +2/-11       | 6  | 8  | 8,6   | 0,3/0,8 | 9         | 25         | 6         | 40      | 8         |
| 8                       | 8          | 0/-8            | +2/-10       | 22 | 0/-9            | +2/-11       | 7  | 9  | 10,6  | 0,3/0,8 | 12        | 25         | 6         | 40      | 8         |
| 10                      | 10         | 0/-8            | +2/-10       | 26 | 0/-9            | +2/-11       | 8  | 10 | 12,6  | 0,3/0,8 | 21        | 25         | 6         | 40      | 8         |
| 12                      | 12         | 0/-8            | +3/-11       | 28 | 0/-9            | +3/-11       | 8  | 10 | 14,7  | 0,3/0,8 | 24        | 25         | 7         | 40      | 8         |
| 15                      | 15         | 0/-8            | +3/-11       | 32 | 0/-11           | +3/-14       | 9  | 11 | 17,7  | 0,3/0,8 | 32        | 25         | 7         | 40      | 10        |
| 17                      | 17         | 0/-8            | +3/-11       | 35 | 0/-11           | +3/-14       | 10 | 12 | 20,2  | 0,3/0,8 | 42        | 25         | 7         | 40      | 10        |
| 20                      | 20         | 0/-10           | +3/-13       | 42 | 0/-11           | +3/-14       | 12 | 14 | 23,5  | 0,3/0,8 | 72        | 25         | 8         | 40      | 10        |
| 25                      | 25         | 0/-10           | +3/-13       | 47 | 0/-11           | +3/-14       | 12 | 14 | 28,6  | 0,3/0,8 | 85        | 25         | 8         | 40      | 10        |
| 30                      | 30         | 0/-10           | +3/-13       | 55 | 0/-13           | +4/-17       | 13 | 15 | 34,1  | 0,3/1   | 123       | 25         | 8         | 40      | 10        |

### Tolerances cont., loads, clearance and torque

| Nominal<br>bore<br>code | Tolerances |           |         |           | Static limit loads |                | Clearances         |           | Reduced<br>Radial | Axial max | Increased<br>Radial | Maximum starting<br>torque |        |
|-------------------------|------------|-----------|---------|-----------|--------------------|----------------|--------------------|-----------|-------------------|-----------|---------------------|----------------------------|--------|
|                         | Sia max    | Precision | Sea max | Precision | Radial<br>$C_s$    | Axial<br>$C_a$ | Standard<br>Radial | Axial max |                   |           |                     | Shielded                   | Sealed |
| –                       | μm         |           |         |           | kN                 |                | μm                 |           |                   |           |                     | mNm                        |        |
| 5                       | 40         | 15        | 40      | 20        | 6,9                | 3,1            | 2/13               | 100       | 2/9               | 80        | 7/15                | 2                          | 4      |
| 6                       | 40         | 15        | 40      | 20        | 9,8                | 4,4            | 2/13               | 100       | 2/9               | 80        | 7/15                | 2,5                        | 5      |
| 8                       | 40         | 15        | 40      | 20        | 12                 | 5,4            | 2/13               | 100       | 2/9               | 80        | 7/15                | 3                          | 6,5    |
| 10                      | 40         | 15        | 40      | 20        | 17,2               | 7,8            | 2/13               | 100       | 2/9               | 80        | 7/15                | 4                          | 7,5    |
| 12                      | 40         | 15        | 40      | 20        | 20,2               | 9,2            | 3/18               | 120       | 3/11              | 100       | 7/15                | 5                          | 8,5    |
| 15                      | 40         | 15        | 40      | 20        | 23,5               | 10,7           | 3/18               | 120       | 3/11              | 100       | 7/15                | 6                          | 10     |
| 17                      | 40         | 15        | 40      | 20        | 26,9               | 12,2           | 3/18               | 120       | 3/11              | 100       | 7/15                | 8                          | 12     |
| 20                      | 40         | 20        | 40      | 20        | 41,5               | 18,8           | 5/20               | 120       | 5/13              | 120       | 7/15                | 10,5                       | 15     |
| 25                      | 40         | 20        | 40      | 20        | 49                 | 22,3           | 5/20               | 120       | 5/13              | 120       | 7/15                | 13,5                       | 18     |
| 30                      | 40         | 20        | 40      | 20        | 62,9               | 28,6           | 5/20               | 150       | 5/13              | 120       | 7/15                | 19                         | 25     |



## Designation system

Examples: ZWJNA20EDN744CP55R10  
JNA 5J7-15

### Surface treatment

**No code** Not plated steel  
**Z** Cadmium plated steel  
**SZ<sup>1)</sup>** Zinc-nickel plated steel

### Material

**No code** Bearing steel  
**W** Corrosion-resistant steel

### Basic designation

### Bore code

### Shield and seal

**No code** Shielded  
**E** Sealed

### Variation

|                               | Tolerances | Lubricant | Clearances                |
|-------------------------------|------------|-----------|---------------------------|
| <b>J7-15<sup>1)</sup></b>     | Standard   | G354      | Increased radial          |
| <b>DJ7-15<sup>1)</sup></b>    | Precision  | G354      | Increased radial          |
| <b>J7-15G81<sup>1)</sup></b>  | Standard   | G395      | Increased radial          |
| <b>DJ7-15G81<sup>1)</sup></b> | Precision  | G395      | Increased radial          |
| <b>No code<sup>1)</sup></b>   | Standard   | G354      | Reduced radial and axial  |
| <b>DN744</b>                  | Precision  | G354      | Reduced radial and axial  |
| <b>DN814</b>                  | Precision  | G395      | Reduced radial and axial  |
| <b>N813<sup>2)</sup></b>      | Standard   | G395      | Standard radial and axial |
| <b>N743<sup>3)</sup></b>      | Standard   | G354      | Standard radial and axial |

### Passivation

**No code** Not treated  
**CP55<sup>4)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**R10<sup>1)</sup>** 0,1 mm oversized outer diameter  
**R20<sup>1)</sup>** 0,2 mm oversized outer diameter

<sup>1)</sup> SKF option

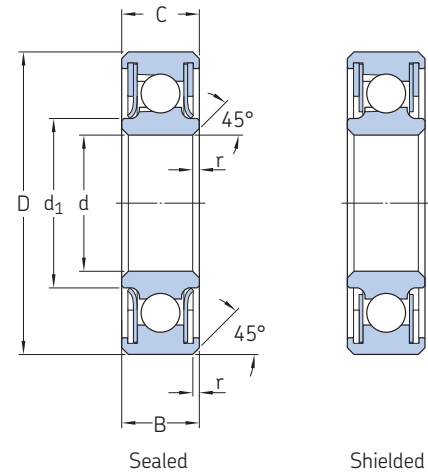
<sup>2)</sup> Replaces N811

<sup>3)</sup> Replaces N741

<sup>4)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

1.3 Deep groove ball bearing single row (metric dimensions)

T..



|                         |   |
|-------------------------|---|
| Technical specification | - |
| Product standard        | - |

Dimensions and tolerances

| Nominal bore code | Dimensions |                 | D   | $\Delta D_{mp}$ | C  | B  | $d_1 \approx$ | r   | Mass $\approx$ | Tolerances       |           |
|-------------------|------------|-----------------|-----|-----------------|----|----|---------------|-----|----------------|------------------|-----------|
|                   | d          | $\Delta d_{mp}$ |     |                 |    |    |               |     |                | Kia max Standard | Precision |
| -                 | mm         | $\mu m$         | mm  | $\mu m$         | mm | mm | mm            | mm  | g              | $\mu m$          |           |
| 10                | 10         | 0/-8            | 22  | 0/-9            | 6  | 6  | 13            | 0,5 | 11             | 25               | 8         |
| 12                | 12         | 0/-8            | 24  | 0/-9            | 6  | 6  | 15            | 0,5 | 13             | 25               | 10        |
| 15                | 15         | 0/-8            | 28  | 0/-9            | 6  | 6  | 18,2          | 0,5 | 15             | 25               | 10        |
| 16                | 16         | 0/-8            | 30  | 0/-9            | 6  | 6  | 19,2          | 0,5 | 17             | 25               | 10        |
| 20                | 20         | 0/-10           | 35  | 0/-11           | 7  | 7  | 23,3          | 0,5 | 25             | 25               | 13        |
| 25                | 25         | 0/-10           | 40  | 0/-11           | 7  | 7  | 28,5          | 0,5 | 29             | 25               | 13        |
| 28                | 28         | 0/-10           | 43  | 0/-11           | 7  | 7  | 31,5          | 0,5 | 32             | 25               | 13        |
| 32                | 32         | 0/-11           | 48  | 0/-11           | 7  | 7  | 35,3          | 0,5 | 39             | 25               | 15        |
| 35                | 35         | 0/-12           | 51  | 0/-11           | 7  | 7  | 38,3          | 0,5 | 42             | 25               | 15        |
| 40                | 40         | 0/-12           | 57  | 0/-13           | 8  | 8  | 44,5          | 0,5 | 56             | 25               | 15        |
| 45                | 45         | 0/-12           | 62  | 0/-13           | 8  | 8  | 49,5          | 0,5 | 60             | 25               | 15        |
| 50                | 50         | 0/-12           | 68  | 0/-13           | 8  | 8  | 54,7          | 0,5 | 67             | 25               | 15        |
| 55                | 55         | 0/-15           | 73  | 0/-15           | 8  | 8  | 59,7          | 0,5 | 76             | 25               | 20        |
| 63                | 63         | 0/-15           | 82  | 0/-15           | 9  | 9  | 67,2          | 0,5 | 110            | 25               | 20        |
| 80                | 80         | 0/-17           | 100 | 0/-17           | 9  | 9  | 84,4          | 0,5 | 132            | 25               | 20        |
| 90                | 90         | 0/-17           | 115 | 0/-17           | 9  | 9  | 96,9          | 0,5 | 223            | 25               | 20        |

## Designation system

|                          |                                      |   |    |   |    |   |   |        |     |      |     |
|--------------------------|--------------------------------------|---|----|---|----|---|---|--------|-----|------|-----|
| Examples:                | ZWAT20EDJ12-18G81CP55R10             | Z | WA | T | 20 | E | D | J12-18 | G81 | CP55 | R10 |
|                          | T40                                  |   |    |   |    |   |   |        |     |      |     |
| <b>Surface treatment</b> |                                      |   |    |   |    |   |   |        |     |      |     |
| No code                  | Not plated steel                     |   |    |   |    |   |   |        |     |      |     |
| Z                        | Cadmium plated steel                 |   |    |   |    |   |   |        |     |      |     |
| SZ                       | Zinc-nickel plated steel             |   |    |   |    |   |   |        |     |      |     |
| <b>Material</b>          |                                      |   |    |   |    |   |   |        |     |      |     |
| No code                  | Bearing steel                        |   |    |   |    |   |   |        |     |      |     |
| WA                       | Corrosion-resistant steel            |   |    |   |    |   |   |        |     |      |     |
| <b>Basic designation</b> |                                      |   |    |   |    |   |   |        |     |      |     |
| <b>Bore code</b>         |                                      |   |    |   |    |   |   |        |     |      |     |
| <b>Shield and seal</b>   |                                      |   |    |   |    |   |   |        |     |      |     |
| No code                  | Shielded                             |   |    |   |    |   |   |        |     |      |     |
| E                        | Sealed                               |   |    |   |    |   |   |        |     |      |     |
| <b>Tolerances</b>        |                                      |   |    |   |    |   |   |        |     |      |     |
| No code                  | Standard                             |   |    |   |    |   |   |        |     |      |     |
| D                        | Precision                            |   |    |   |    |   |   |        |     |      |     |
| <b>Radial clearance</b>  |                                      |   |    |   |    |   |   |        |     |      |     |
| No code                  | Standard clearance                   |   |    |   |    |   |   |        |     |      |     |
| J12-18                   | Increased clearance                  |   |    |   |    |   |   |        |     |      |     |
| <b>Lubrication</b>       |                                      |   |    |   |    |   |   |        |     |      |     |
| No code                  | Grease G354                          |   |    |   |    |   |   |        |     |      |     |
| G81                      | Grease G395                          |   |    |   |    |   |   |        |     |      |     |
| <b>Passivation</b>       |                                      |   |    |   |    |   |   |        |     |      |     |
| No code                  | Not treated                          |   |    |   |    |   |   |        |     |      |     |
| CP55 <sup>1)</sup>       | Passivated corrosion-resistant steel |   |    |   |    |   |   |        |     |      |     |
| <b>Over-size</b>         |                                      |   |    |   |    |   |   |        |     |      |     |
| No code                  | Standard outer diameter size         |   |    |   |    |   |   |        |     |      |     |
| R10                      | 0,1 mm oversized outer diameter      |   |    |   |    |   |   |        |     |      |     |
| R20                      | 0,2 mm oversized outer diameter      |   |    |   |    |   |   |        |     |      |     |

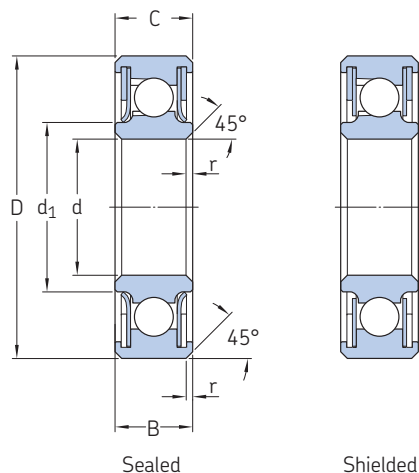
<sup>1)</sup> Available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances       |           | Sia max  |           | Sea max  |           | Static limit loads    |                      | Clearance       |                  | Maximum starting torque |        |
|-------------------|------------------|-----------|----------|-----------|----------|-----------|-----------------------|----------------------|-----------------|------------------|-------------------------|--------|
|                   | Kea max Standard | Precision | Standard | Precision | Standard | Precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Standard Radial | Increased Radial | Shielded                | Sealed |
| –                 | μm               |           |          |           |          |           | kN                    |                      | μm              |                  | mNm                     |        |
| <b>10</b>         | 40               | 13        | 40       | 15        | 40       | 20        | 10,8                  | 4,9                  | 2/7             | 12/18            | 4                       | 7      |
| <b>12</b>         | 40               | 13        | 40       | 15        | 40       | 20        | 12,3                  | 5,6                  | 2/7             | 12/18            | 4                       | 7      |
| <b>15</b>         | 40               | 13        | 40       | 15        | 40       | 20        | 14,5                  | 6,5                  | 3/11            | 12/18            | 4                       | 7      |
| <b>16</b>         | 40               | 13        | 40       | 15        | 40       | 20        | 15,2                  | 6,8                  | 3/11            | 12/18            | 5                       | 8      |
| <b>20</b>         | 40               | 15        | 40       | 20        | 40       | 20        | 18,6                  | 8,3                  | 5/13            | 12/18            | 6                       | 9      |
| <b>25</b>         | 40               | 15        | 40       | 20        | 40       | 20        | 22,2                  | 9,9                  | 5/13            | 12/18            | 8                       | 14     |
| <b>28</b>         | 40               | 15        | 40       | 20        | 40       | 20        | 24,2                  | 10,8                 | 5/13            | 12/18            | 11                      | 16     |
| <b>32</b>         | 40               | 15        | 40       | 20        | 40       | 20        | 27                    | 12,1                 | 5/13            | 12/18            | 14                      | 20     |
| <b>35</b>         | 40               | 20        | 40       | 20        | 40       | 20        | 29                    | 13,0                 | 5/13            | 12/18            | 18                      | 23     |
| <b>40</b>         | 40               | 20        | 40       | 20        | 40       | 20        | 33,2                  | 14,9                 | 5/13            | 12/18            | 22                      | 29     |
| <b>45</b>         | 40               | 20        | 40       | 20        | 40       | 20        | 36,7                  | 16,4                 | 5/13            | 12/18            | 26                      | 35     |
| <b>50</b>         | 40               | 20        | 40       | 20        | 40       | 20        | 40,2                  | 17,9                 | 5/13            | 12/18            | 32                      | 45     |
| <b>55</b>         | 40               | 20        | 40       | 20        | 40       | 20        | 43,6                  | 19,5                 | 5/13            | 12/18            | 39                      | 60     |
| <b>63</b>         | 40               | 20        | 40       | 20        | 40       | 20        | 61,7                  | 27,5                 | 5/13            | 12/18            | 55                      | 75     |
| <b>80</b>         | 40               | 20        | 40       | 20        | 40       | 20        | 75,7                  | 33,8                 | 5/13            | 12/18            | 75                      | 120    |
| <b>90</b>         | 40               | 20        | 40       | 20        | 40       | 20        | 86,5                  | 38,6                 | 5/13            | 12/18            | 110                     | 160    |

## 1.4 Deep groove ball bearing single row (metric dimensions)

TA..



### Technical specification

EN 3280

### Product standard

Standard clearances:

EN 3281 (Bearing steel)  
EN 3282 (Bearing steel  
cadmium plated)  
EN 3283 (Corrosion-  
resistant steel)

Reduced clearances:

EN 4033 (Corrosion-  
resistant steel)

### Dimensions and tolerances

| Nominal<br>bore<br>code | Dimensions |                 | D  | $\Delta D_{mp}$ | C  | B  | $d_1$ | r   | Mass<br>≈ | Tolerances |           |         |           |
|-------------------------|------------|-----------------|----|-----------------|----|----|-------|-----|-----------|------------|-----------|---------|-----------|
|                         | d          | $\Delta d_{mp}$ |    |                 |    |    |       |     |           | Kia max    | Precision | Kea max | Precision |
| –                       | mm         | μm              | mm | μm              | mm | mm | mm    | mm  | g         | μm         |           | μm      |           |
| 10                      | 10         | 0/-8            | 22 | 0/-9            | 6  | 6  | 13    | 0,5 | 11        | 25         | 8         | 40      | 13        |
| 12                      | 12         | 0/-8            | 24 | 0/-9            | 6  | 6  | 15    | 0,5 | 13        | 25         | 10        | 40      | 13        |
| 15                      | 15         | 0/-8            | 28 | 0/-9            | 7  | 7  | 17,6  | 0,5 | 16        | 25         | 10        | 40      | 13        |
| 17                      | 17         | 0/-8            | 30 | 0/-9            | 7  | 7  | 19,6  | 0,5 | 18        | 25         | 10        | 40      | 13        |
| 20                      | 20         | 0/-10           | 32 | 0/-11           | 7  | 7  | 23    | 0,5 | 20        | 25         | 13        | 40      | 15        |
| 25                      | 25         | 0/-10           | 37 | 0/-11           | 7  | 7  | 28,1  | 0,5 | 23        | 25         | 13        | 40      | 15        |
| 30                      | 30         | 0/-10           | 42 | 0/-11           | 7  | 7  | 33,1  | 0,5 | 26        | 25         | 13        | 40      | 15        |
| 35                      | 35         | 0/-12           | 47 | 0/-11           | 7  | 7  | 38,3  | 0,5 | 30        | 25         | 15        | 40      | 15        |
| 40                      | 40         | 0/-12           | 52 | 0/-13           | 7  | 7  | 43,3  | 0,5 | 38        | 25         | 15        | 40      | 20        |
| 50                      | 50         | 0/-12           | 65 | 0/-13           | 7  | 7  | 53    | 0,5 | 55        | 25         | 15        | 40      | 20        |
| 60                      | 60         | 0/-15           | 78 | 0/-13           | 10 | 10 | 63,5  | 0,5 | 100       | 25         | 20        | 40      | 20        |

### Tolerances cont., loads, clearance and torque

| Nominal<br>bore<br>code | Tolerances |          | Sea max | Precision | Static limit loads |                | Clearances |           | Reduced | Axial max | Increased | Maximum starting torque |        |
|-------------------------|------------|----------|---------|-----------|--------------------|----------------|------------|-----------|---------|-----------|-----------|-------------------------|--------|
|                         | Sia max    | Standard |         |           | Radial<br>$C_s$    | Axial<br>$C_a$ | Standard   | Axial max |         |           |           | Shielded                | Sealed |
| –                       | μm         |          |         |           | kN                 |                | μm         |           |         |           |           | mNm                     |        |
| 10                      | 40         | 15       | 40      | 20        | 10,8               | 4,9            | 2/13       | 100       | 2/7     | 100       | 12/18     | 4,5                     | 12     |
| 12                      | 40         | 15       | 40      | 20        | 12,3               | 5,6            | 3/18       | 100       | 2/7     | 100       | 12/18     | 5                       | 13     |
| 15                      | 40         | 15       | 40      | 20        | 16,3               | 7,4            | 3/18       | 100       | 2/7     | 100       | 12/18     | 5,5                     | 14     |
| 17                      | 40         | 15       | 40      | 20        | 17,7               | 8,0            | 3/18       | 100       | 2/7     | 100       | 12/18     | 6                       | 15     |
| 20                      | 40         | 20       | 40      | 20        | 17,4               | 7,9            | 5/20       | 100       | 2/9     | 100       | 12/18     | 6,5                     | 16     |
| 25                      | 40         | 20       | 40      | 20        | 21,5               | 9,8            | 5/20       | 100       | 2/9     | 100       | 12/18     | 8,5                     | 18     |
| 30                      | 40         | 20       | 40      | 20        | 24,7               | 11,1           | 5/20       | 100       | 2/9     | 100       | 12/18     | 14                      | 20     |
| 35                      | 40         | 20       | 40      | 20        | 28,6               | 12,9           | 6/20       | 100       | 2/9     | 100       | 12/18     | 18                      | 23     |
| 40                      | 40         | 20       | 40      | 20        | 32                 | 14,5           | 6/20       | 100       | 2/9     | 100       | 12/18     | 22                      | 29     |
| 50                      | 40         | 20       | 40      | 20        | 43,1               | 19,6           | 6/23       | 120       | 2/9     | 120       | 12/18     | 32                      | 47     |
| 60                      | 40         | 20       | 40      | 20        | 70                 | 31,8           | 8/28       | 150       | 2/9     | 150       | 12/18     | 55                      | 77     |



## Designation system

|                               |                                      |   |    |    |    |   |   |      |      |     |
|-------------------------------|--------------------------------------|---|----|----|----|---|---|------|------|-----|
| Examples:                     | ZWATA20EDN743CP55R10<br>TA40J12-18   | Z | WA | TA | 20 | E | D | N743 | CP55 | R10 |
| <b>Surface treatment</b>      |                                      |   |    |    |    |   |   |      |      |     |
| <b>No code</b>                | Not plated steel                     |   |    |    |    |   |   |      |      |     |
| <b>Z</b>                      | Cadmium plated steel                 |   |    |    |    |   |   |      |      |     |
| <b>SZ<sup>1)</sup></b>        | Zinc-nickel plated steel             |   |    |    |    |   |   |      |      |     |
| <b>Material</b>               |                                      |   |    |    |    |   |   |      |      |     |
| <b>No code</b>                | Bearing steel                        |   |    |    |    |   |   |      |      |     |
| <b>WA</b>                     | Corrosion-resistant steel            |   |    |    |    |   |   |      |      |     |
| <b>Basic designation</b>      |                                      |   |    |    |    |   |   |      |      |     |
| <b>Bore code</b>              |                                      |   |    |    |    |   |   |      |      |     |
| <b>Shield and seal</b>        |                                      |   |    |    |    |   |   |      |      |     |
| <b>No code</b>                | Shielded                             |   |    |    |    |   |   |      |      |     |
| <b>E</b>                      | Sealed                               |   |    |    |    |   |   |      |      |     |
| <b>Tolerances</b>             |                                      |   |    |    |    |   |   |      |      |     |
| <b>No code</b>                | Standard                             |   |    |    |    |   |   |      |      |     |
| <b>D<sup>1)</sup></b>         | Precision                            |   |    |    |    |   |   |      |      |     |
| <b>Variation</b>              |                                      |   |    |    |    |   |   |      |      |     |
|                               | <b>Lubricant</b>                     |   |    |    |    |   |   |      |      |     |
| <b>J12-18<sup>1)</sup></b>    | G354                                 |   |    |    |    |   |   |      |      |     |
| <b>J12-18G81<sup>1)</sup></b> | G395                                 |   |    |    |    |   |   |      |      |     |
| <b>N745<sup>2)</sup></b>      | G354                                 |   |    |    |    |   |   |      |      |     |
| <b>N815</b>                   | G395                                 |   |    |    |    |   |   |      |      |     |
| <b>N813<sup>3)</sup></b>      | G395                                 |   |    |    |    |   |   |      |      |     |
| <b>N743<sup>4)</sup></b>      | G354                                 |   |    |    |    |   |   |      |      |     |
|                               | <b>Clearances</b>                    |   |    |    |    |   |   |      |      |     |
|                               | Increased radial                     |   |    |    |    |   |   |      |      |     |
|                               | Increased radial                     |   |    |    |    |   |   |      |      |     |
|                               | Reduced radial and axial             |   |    |    |    |   |   |      |      |     |
|                               | Reduced radial and axial             |   |    |    |    |   |   |      |      |     |
|                               | Standard radial and axial            |   |    |    |    |   |   |      |      |     |
|                               | Standard radial and axial            |   |    |    |    |   |   |      |      |     |
| <b>Passivation</b>            |                                      |   |    |    |    |   |   |      |      |     |
| <b>No code</b>                | Not treated                          |   |    |    |    |   |   |      |      |     |
| <b>CP55<sup>5)</sup></b>      | Passivated corrosion-resistant steel |   |    |    |    |   |   |      |      |     |
| <b>Oversize</b>               |                                      |   |    |    |    |   |   |      |      |     |
| <b>No code</b>                | Standard outer diameter size         |   |    |    |    |   |   |      |      |     |
| <b>R10<sup>1)</sup></b>       | 0,1 mm oversized outer diameter      |   |    |    |    |   |   |      |      |     |
| <b>R20<sup>1)</sup></b>       | 0,2 mm oversized outer diameter      |   |    |    |    |   |   |      |      |     |

<sup>1)</sup> SKF option

<sup>2)</sup> Replaces no code

<sup>3)</sup> Replaces N811

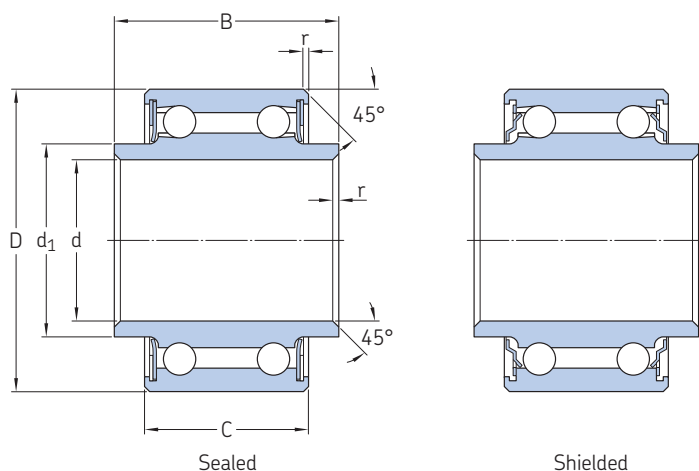
<sup>4)</sup> Replaces N741

<sup>5)</sup> Available only for corrosion-resistant steel material without other surface treatment

## 1.5 Deep groove ball bearing double row (metric dimensions)

AG..

Technical specification –  
Product standard –



### Dimensions and tolerances

| Nominal bore code | Dimensions |              |        |    |      |        | C<br>0<br>-0,12 | B<br>0<br>-0,12 | d <sub>1</sub><br>≈ | r<br>+0,3<br>-0,2 | Mass<br>≈<br>g | Tolerances          |           |
|-------------------|------------|--------------|--------|----|------|--------|-----------------|-----------------|---------------------|-------------------|----------------|---------------------|-----------|
|                   | d          | Δdmp<br>(J7) | Δds    | D  | ΔDmp | ΔDs    |                 |                 |                     |                   |                | Kia max<br>Standard | Precision |
| –                 | mm         | μm           |        | mm | μm   |        |                 |                 |                     |                   |                | μm                  |           |
| 6                 | 6          | +8/-7        | +2/-10 | 19 | 0/-8 | +2/-11 | 12              | 17              | 8,6                 | 0,5               | 22             | 25                  | 6         |
| 8                 | 8          | +8/-7        | +2/-10 | 22 | 0/-8 | +2/-11 | 17              | 23              | 11,1                | 0,5               | 32             | 25                  | 6         |
| 10                | 10         | +8/-7        | +2/-10 | 24 | 0/-8 | +2/-11 | 17              | 23              | 13,1                | 0,5               | 42             | 25                  | 6         |
| 12                | 12         | +10/-8       | +3/-11 | 26 | 0/-9 | +2/-11 | 17              | 23              | 15,3                | 0,5               | 46             | 25                  | 7         |
| 16                | 16         | +10/-8       | +3/-11 | 30 | 0/-9 | +2/-11 | 17              | 23              | 19,1                | 0,5               | 57             | 25                  | 7         |

### Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances          |           |                     |           |                     |           | Static limit loads       |                         | Diagonal clearance | Increased radial clearance | Maximum starting torque |        |
|-------------------|---------------------|-----------|---------------------|-----------|---------------------|-----------|--------------------------|-------------------------|--------------------|----------------------------|-------------------------|--------|
|                   | Kia max<br>Standard | Precision | Sia max<br>Standard | Precision | Sea max<br>Standard | Precision | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> |                    |                            | Shielded                | Sealed |
| –                 | μm                  |           |                     |           |                     |           | kN                       |                         | μm                 |                            | mNm                     |        |
| 6                 | 40                  | 10        | 40                  | 15        | 40                  | 20        | 16,6                     | 7,4                     | 50/ 250            | 7/15                       | 3                       | 5      |
| 8                 | 40                  | 10        | 40                  | 15        | 40                  | 20        | 20,8                     | 9,3                     | 50/ 250            | 7/15                       | 4                       | 6      |
| 10                | 40                  | 10        | 40                  | 15        | 40                  | 20        | 24                       | 10,6                    | 50/ 250            | 7/15                       | 6                       | 9      |
| 12                | 40                  | 10        | 40                  | 15        | 40                  | 20        | 26,3                     | 11,8                    | 50/ 250            | 7/15                       | 7                       | 11     |
| 16                | 40                  | 10        | 40                  | 15        | 40                  | 20        | 31,8                     | 14,2                    | 50/ 250            | 7/15                       | 9                       | 14     |



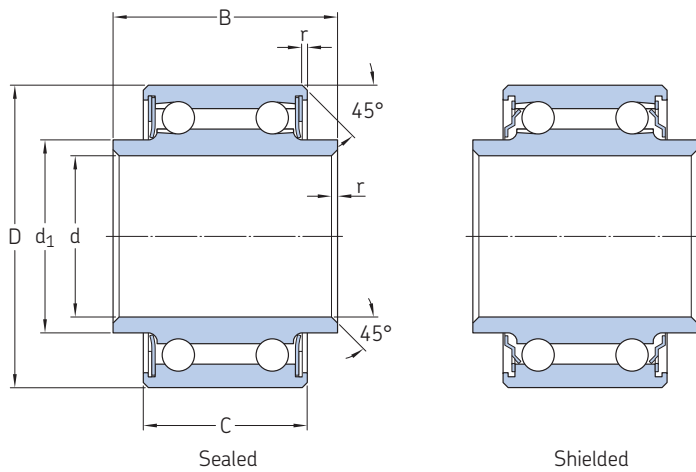
## Designation system

|                          |                                      |   |   |    |    |   |   |       |     |      |     |
|--------------------------|--------------------------------------|---|---|----|----|---|---|-------|-----|------|-----|
| Examples:                | ZWAG10EDJ7-15G81CP55R10              | Z | W | AG | 10 | E | D | J7-15 | G81 | CP55 | R10 |
|                          | AG 6                                 |   |   |    |    |   |   |       |     |      |     |
| <b>Surface treatment</b> |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Not plated steel                     |   |   |    |    |   |   |       |     |      |     |
| Z                        | Cadmium plated steel                 |   |   |    |    |   |   |       |     |      |     |
| SZ                       | Zinc-nickel plated steel             |   |   |    |    |   |   |       |     |      |     |
| <b>Material</b>          |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Bearing steel                        |   |   |    |    |   |   |       |     |      |     |
| W                        | Corrosion-resistant steel            |   |   |    |    |   |   |       |     |      |     |
| <b>Basic designation</b> |                                      |   |   |    |    |   |   |       |     |      |     |
| <b>Bore code</b>         |                                      |   |   |    |    |   |   |       |     |      |     |
| <b>Shield and seal</b>   |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Shielded                             |   |   |    |    |   |   |       |     |      |     |
| E                        | Sealed                               |   |   |    |    |   |   |       |     |      |     |
| <b>Tolerances</b>        |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Standard                             |   |   |    |    |   |   |       |     |      |     |
| D                        | Precision                            |   |   |    |    |   |   |       |     |      |     |
| <b>Clearances</b>        |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Diagonal clearance                   |   |   |    |    |   |   |       |     |      |     |
| J7-15                    | Increased radial clearance           |   |   |    |    |   |   |       |     |      |     |
| <b>Lubrication</b>       |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Grease G354                          |   |   |    |    |   |   |       |     |      |     |
| G81                      | Grease G395                          |   |   |    |    |   |   |       |     |      |     |
| <b>Passivation</b>       |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Not treated                          |   |   |    |    |   |   |       |     |      |     |
| CP55 <sup>1)</sup>       | Passivated corrosion-resistant steel |   |   |    |    |   |   |       |     |      |     |
| <b>Oversize</b>          |                                      |   |   |    |    |   |   |       |     |      |     |
| No code                  | Standard outer diameter size         |   |   |    |    |   |   |       |     |      |     |
| R10                      | 0,1 mm oversized outer diameter      |   |   |    |    |   |   |       |     |      |     |
| R20                      | 0,2 mm oversized outer diameter      |   |   |    |    |   |   |       |     |      |     |

<sup>1)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## 1.6 Deep groove ball bearing double row (metric dimensions)

AGN..



|                         |                                                                                                                 |
|-------------------------|-----------------------------------------------------------------------------------------------------------------|
| Technical specification | EN 3280                                                                                                         |
| Product standard        | EN 3056 (Bearing steel)<br>EN 3057 (Bearing steel<br>cadmium plated)<br>EN 3058 (Corrosion-<br>resistant steel) |

### Dimensions and tolerances

| Nominal<br>bore<br>code | Dimensions |              |        |    |      |        | C<br>0<br>-0,12 | B<br>0<br>-0,12 | d <sub>1</sub><br>≈ | r<br>+0,3<br>-0,2 | Mass<br>≈<br>g | Tolerances          |           |
|-------------------------|------------|--------------|--------|----|------|--------|-----------------|-----------------|---------------------|-------------------|----------------|---------------------|-----------|
|                         | d          | Δdmp<br>(J7) | Δds    | D  | ΔDmp | ΔDs    |                 |                 |                     |                   |                | Kia max<br>Standard | Precision |
| –                       | mm         | μm           |        | mm | μm   | mm     |                 |                 |                     |                   | g              | μm                  |           |
| <b>8</b>                | 8          | +8/-7        | +2/-10 | 22 | 0/-8 | +2/-11 | 17              | 22              | 10,6                | 0,5               | 30             | 25                  | 6         |
| <b>10</b>               | 10         | +8/-7        | +2/-10 | 26 | 0/-8 | +2/-11 | 18              | 24              | 12,6                | 0,5               | 52             | 25                  | 6         |
| <b>12</b>               | 12         | +10/-8       | +3/-11 | 28 | 0/-8 | +2/-11 | 18              | 24              | 14,7                | 0,5               | 60             | 25                  | 7         |
| <b>15</b>               | 15         | +10/-8       | +3/-11 | 32 | 0/-9 | +3/-14 | 20              | 26              | 17,7                | 0,5               | 80             | 25                  | 7         |
| <b>17</b>               | 17         | +10/-8       | +3/-11 | 35 | 0/-9 | +3/-14 | 22              | 28              | 20,2                | 0,5               | 100            | 25                  | 7         |
| <b>20</b>               | 20         | +12/-9       | +3/-13 | 42 | 0/-9 | +3/-14 | 26              | 32              | 23,5                | 0,5               | 165            | 25                  | 8         |

### Tolerances cont., loads, clearance and torque

| Nominal<br>bore<br>code | Tolerances          |           |                     |           |                     |           | Static limit loads       |                         | Diagonal<br>clearance | Increased radial<br>clearance | Maximum starting<br>torque |        |
|-------------------------|---------------------|-----------|---------------------|-----------|---------------------|-----------|--------------------------|-------------------------|-----------------------|-------------------------------|----------------------------|--------|
|                         | Kia max<br>Standard | Precision | Sia max<br>Standard | Precision | Sea max<br>Standard | Precision | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> |                       |                               | Shielded                   | Sealed |
| –                       | μm                  |           |                     |           |                     |           | kN                       |                         | μm                    |                               | mNm                        |        |
| <b>8</b>                | 40                  | 10        | 40                  | 15        | 40                  | 20        | 24                       | 10,9                    | 50/ 250               | 7/15                          | 4                          | 6      |
| <b>10</b>               | 40                  | 10        | 40                  | 15        | 40                  | 20        | 34,4                     | 15,6                    | 50/ 250               | 7/15                          | 6                          | 9      |
| <b>12</b>               | 40                  | 10        | 40                  | 15        | 40                  | 20        | 40,4                     | 18,4                    | 50/ 250               | 7/15                          | 7                          | 11     |
| <b>15</b>               | 40                  | 10        | 40                  | 15        | 40                  | 20        | 47                       | 21,4                    | 50/ 250               | 7/15                          | 9                          | 14     |
| <b>17</b>               | 40                  | 10        | 40                  | 15        | 40                  | 20        | 53,8                     | 24,5                    | 50/ 250               | 7/15                          | 11                         | 17     |
| <b>20</b>               | 40                  | 10        | 40                  | 20        | 40                  | 20        | 83                       | 37,7                    | 50/ 250               | 7/15                          | 15                         | 23     |



## Designation system

|                           |                                      |   |   |     |    |   |   |       |     |      |     |
|---------------------------|--------------------------------------|---|---|-----|----|---|---|-------|-----|------|-----|
| Examples:                 | ZWAGN20EDJ7-15G81CP55R10             | Z | W | AGN | 20 | E | D | J7-15 | G81 | CP55 | R10 |
|                           | AGN 8                                |   |   |     |    |   |   |       |     |      |     |
| <b>Surface treatment</b>  |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>No code</b>            | Not plated steel                     |   |   |     |    |   |   |       |     |      |     |
| <b>Z</b>                  | Cadmium plated steel                 |   |   |     |    |   |   |       |     |      |     |
| <b>SZ<sup>1)</sup></b>    | Zinc-nickel plated steel             |   |   |     |    |   |   |       |     |      |     |
| <b>Material</b>           |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>No code</b>            | Bearing steel                        |   |   |     |    |   |   |       |     |      |     |
| <b>W</b>                  | Corrosion-resistant steel            |   |   |     |    |   |   |       |     |      |     |
| <b>Basic designation</b>  |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>Bore code</b>          |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>Shield and seal</b>    |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>No code</b>            | Shielded                             |   |   |     |    |   |   |       |     |      |     |
| <b>E</b>                  | Sealed                               |   |   |     |    |   |   |       |     |      |     |
| <b>Tolerances</b>         |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>No code</b>            | Standard                             |   |   |     |    |   |   |       |     |      |     |
| <b>D<sup>1)</sup></b>     | Precision                            |   |   |     |    |   |   |       |     |      |     |
| <b>Clearances</b>         |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>No code</b>            | Diagonal clearance                   |   |   |     |    |   |   |       |     |      |     |
| <b>J7-15<sup>1)</sup></b> | Increased radial clearance           |   |   |     |    |   |   |       |     |      |     |
| <b>Lubrication</b>        |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>No code</b>            | Grease G354                          |   |   |     |    |   |   |       |     |      |     |
| <b>G81</b>                | Grease G395                          |   |   |     |    |   |   |       |     |      |     |
| <b>Passivation</b>        |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>No code</b>            | Not treated                          |   |   |     |    |   |   |       |     |      |     |
| <b>CP55<sup>2)</sup></b>  | Passivated corrosion-resistant steel |   |   |     |    |   |   |       |     |      |     |
| <b>Oversize</b>           |                                      |   |   |     |    |   |   |       |     |      |     |
| <b>No code</b>            | Standard outer diameter size         |   |   |     |    |   |   |       |     |      |     |
| <b>R10<sup>1)</sup></b>   | 0,1 mm oversized outer diameter      |   |   |     |    |   |   |       |     |      |     |
| <b>R20<sup>1)</sup></b>   | 0,2 mm oversized outer diameter      |   |   |     |    |   |   |       |     |      |     |

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## 1.7 Deep groove ball bearing with self-aligning ring single row (metric dimensions)

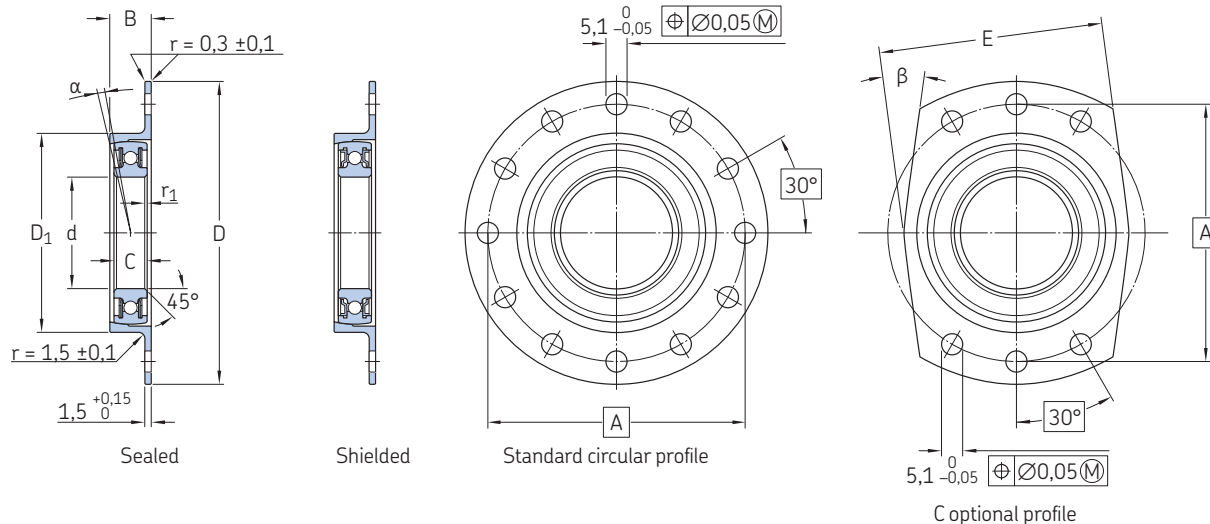
TRCE..

### Technical specification

EN 3727

### Product standard

EN 3059 (bearing steel bearing and cadmium plated steel ring)  
EN 3060 (bearing steel cadmium plated bearing and cadmium plated steel ring)  
EN 3061 (Corrosion-resistant steel bearing and ring)



### Dimensions

| Nominal bore code | Dimensions | d     | Δdmp<br>For products per EN standard | For other products | Δds    | D ±0,2 | C<br>For products per EN standard 0/-0,12 | For other products 0/-0,1 | B ±0,15 | D1 ±0,05 | A   | r1 +0,3 -0,2 | E<br>For products per EN standard ±1 | For other products |
|-------------------|------------|-------|--------------------------------------|--------------------|--------|--------|-------------------------------------------|---------------------------|---------|----------|-----|--------------|--------------------------------------|--------------------|
| –                 | mm μm      |       |                                      |                    |        | mm     |                                           |                           |         |          |     |              |                                      |                    |
| 16                | 16         | 0/-8  |                                      | 0/-8               | +3/-11 | 58     | 6                                         | 6                         | 8       | 33       | 47  | 0,5          | 36                                   | 35                 |
| 20                | 20         | 0/-10 |                                      | 0/-10              | +3/-13 | 63     | 7                                         | 7                         | 9       | 38       | 52  | 0,5          | 42                                   | 42                 |
| 25                | 25         | 0/-10 |                                      | 0/-10              | +3/-13 | 68     | 7                                         | 7                         | 9       | 43       | 57  | 0,5          | 46                                   | 46                 |
| 32                | 32         | 0/-12 |                                      | 0/-11              | +3/-15 | 77     | 7                                         | 7                         | 9       | 52       | 66  | 0,5          | 55                                   | 55                 |
| 35                | 35         | 0/-12 |                                      | 0/-12              | +3/-15 | 80     | 7                                         | 7                         | 9       | 55       | 69  | 0,5          | 58                                   | 58                 |
| 40                | 40         | 0/-12 |                                      | 0/-12              | +3/-15 | 86     | 8                                         | 8                         | 10      | 61       | 75  | 0,5          | 64                                   | 64                 |
| 45                | 45         | 0/-12 |                                      | 0/-12              | +3/-15 | 91     | 8                                         | 8                         | 10      | 66       | 80  | 0,5          | 68                                   | 68                 |
| 50                | 50         | 0/-12 |                                      | 0/-12              | +3/-15 | 97     | 8                                         | 8                         | 10      | 72       | 86  | 0,5          | 74                                   | 74                 |
| 63                | 63         | 0/-15 |                                      | 0/-15              | +4/-19 | 111    | 9                                         | 9                         | 11      | 86       | 100 | 0,5          | 90                                   | 90                 |

### Dimensions, loads and clearance

| Nominal bore code | Dimensions |                                     | For other products | Mass Standard circular profile ≈ | Optional profile ≈ | Static limit load Radial C <sub>s</sub> | Clearances                                                  |                                                                     | Axial max between outer and inner rings |
|-------------------|------------|-------------------------------------|--------------------|----------------------------------|--------------------|-----------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------|
|                   | α          | β For products per EN standard ± 1° |                    |                                  |                    |                                         | Radial Bearing in corrosion-resistant steel per EN standard | For other bearings in bearing steel or in corrosion-resistant steel |                                         |
| –                 | °          |                                     |                    | g                                |                    | kN                                      | μm                                                          |                                                                     |                                         |
| 16                | 4          | 0                                   | 0                  | 47                               | 38                 | 15,2                                    | 2/7                                                         | 3/11                                                                | 120                                     |
| 20                | 3,5        | 14                                  | 14                 | 62                               | 50                 | 18,7                                    | 2/7                                                         | 5/13                                                                | 120                                     |
| 25                | 3          | 14                                  | 14                 | 70                               | 58                 | 20,6                                    | 2/7                                                         | 5/13                                                                | 120                                     |
| 32                | 2,5        | 24                                  | 24                 | 94                               | 78                 | 24,5                                    | 2/7                                                         | 5/13                                                                | 120                                     |
| 35                | 2,3        | 24                                  | 30                 | 100                              | 86                 | 25,5                                    | 2/9                                                         | 5/13                                                                | 120                                     |
| 40                | 2          | 30                                  | 30                 | 125                              | 104                | 29,5                                    | 2/9                                                         | 5/13                                                                | 120                                     |
| 45                | 2          | 30                                  | 30                 | 137                              | 114                | 32,4                                    | 2/9                                                         | 5/13                                                                | 120                                     |
| 50                | 1,7        | 30                                  | 30                 | 155                              | 129                | 35,3                                    | 2/9                                                         | 5/13                                                                | 120                                     |
| 63                | 1,5        | 44                                  | 44                 | 210                              | 178                | 39,2                                    | 2/9                                                         | 5/13                                                                | 120                                     |



## Designation system

|                             |                                               |                    |                          |    |   |                           |   |      |      |     |
|-----------------------------|-----------------------------------------------|--------------------|--------------------------|----|---|---------------------------|---|------|------|-----|
| Examples:                   | XTRCE20TCDN741CP55R10                         | X                  | TRCE                     | 20 | T | C                         | D | N741 | CP55 | R10 |
|                             | SWATRCE16E                                    |                    |                          |    |   |                           |   |      |      |     |
| <b>Prefix code</b>          | <b>Material and surface treatment</b>         |                    |                          |    |   |                           |   |      |      |     |
| <b>No code</b>              | <b>Ball bearing</b>                           |                    |                          |    |   | <b>Self-aligning ring</b> |   |      |      |     |
| <b>Z</b>                    | Bearing steel                                 | –                  |                          |    |   | Cadmium plated steel      |   |      |      |     |
| <b>S<sup>1)</sup></b>       | Bearing steel                                 | Cadmium plated     |                          |    |   | Cadmium plated steel      |   |      |      |     |
| <b>SZ<sup>1)</sup></b>      | Bearing steel                                 | –                  |                          |    |   | Zinc-nickel plated steel  |   |      |      |     |
| <b>WA<sup>1)</sup></b>      | Bearing steel                                 | Zinc-nickel plated |                          |    |   | Zinc-nickel plated steel  |   |      |      |     |
| <b>SWA<sup>1)</sup></b>     | Corrosion-resistant steel                     | –                  |                          |    |   | Cadmium plated steel      |   |      |      |     |
| <b>X</b>                    | Corrosion-resistant steel                     | –                  |                          |    |   | Zinc-nickel plated steel  |   |      |      |     |
|                             |                                               |                    |                          |    |   | Corrosion-resistant steel |   |      |      |     |
| <b>Basic designation</b>    |                                               |                    |                          |    |   |                           |   |      |      |     |
| <b>Bore code</b>            |                                               |                    |                          |    |   |                           |   |      |      |     |
| <b>Shield and seal</b>      |                                               |                    |                          |    |   |                           |   |      |      |     |
| <b>T</b>                    | Shielded                                      |                    |                          |    |   |                           |   |      |      |     |
| <b>E</b>                    | Sealed                                        |                    |                          |    |   |                           |   |      |      |     |
| <b>Flange profile</b>       |                                               |                    |                          |    |   |                           |   |      |      |     |
| <b>No code</b>              | Standard circular profile                     |                    |                          |    |   |                           |   |      |      |     |
| <b>C</b>                    | Optional profile                              |                    |                          |    |   |                           |   |      |      |     |
| <b>Tolerances</b>           |                                               |                    |                          |    |   |                           |   |      |      |     |
| <b>No code</b>              | Standard                                      |                    |                          |    |   |                           |   |      |      |     |
| <b>D<sup>1)</sup></b>       | Precision                                     |                    |                          |    |   |                           |   |      |      |     |
| <b>Variation</b>            |                                               |                    |                          |    |   |                           |   |      |      |     |
| <b>No code<sup>1)</sup></b> | <b>Lubricant</b>                              |                    | <b>Swivelling torque</b> |    |   |                           |   |      |      |     |
| <b>N741</b>                 | G354                                          |                    | Standard                 |    |   |                           |   |      |      |     |
| <b>N811</b>                 | G354                                          |                    | Reduced                  |    |   |                           |   |      |      |     |
|                             | G395                                          |                    | Reduced                  |    |   |                           |   |      |      |     |
| <b>Passivation</b>          |                                               |                    |                          |    |   |                           |   |      |      |     |
| <b>No code</b>              | Not treated                                   |                    |                          |    |   |                           |   |      |      |     |
| <b>CP55<sup>2)</sup></b>    | Passivated corrosion-resistant steel          |                    |                          |    |   |                           |   |      |      |     |
| <b>Oversize</b>             |                                               |                    |                          |    |   |                           |   |      |      |     |
| <b>No code</b>              | Standard outer diameter size                  |                    |                          |    |   |                           |   |      |      |     |
| <b>R10</b>                  | 0,1 mm oversized outer diameter <sup>1)</sup> |                    |                          |    |   |                           |   |      |      |     |
| <b>R20</b>                  | 0,2 mm oversized outer diameter <sup>1)</sup> |                    |                          |    |   |                           |   |      |      |     |

<sup>1)</sup> SKF option

<sup>2)</sup> Available only for corrosion-resistant steel material without other surface treatment

## Torque and tolerances

| Nominal bore code | Maximum starting torque |        | Swivelling torque |         | Tolerances          |           |                     |           |                     |           |                     |           |
|-------------------|-------------------------|--------|-------------------|---------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|
|                   | Shielded                | Sealed | Standard          | Reduced | Kia max<br>Standard | Precision | Kea max<br>Standard | Precision | Sia max<br>Standard | Precision | Sea max<br>Standard | Precision |
| –                 | mNm                     |        | Nm                |         | µm                  |           |                     |           |                     |           |                     |           |
| 16                | 8                       | 12     | 2/7               | 0,8/3   | 25                  | 7         | 40                  | 10        | 40                  | 15        | 40                  | 20        |
| 20                | 9                       | 14     | 3/8               | 0,8/3   | 25                  | 8         | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 25                | 12                      | 21     | 4/9               | 0,8/3   | 25                  | 8         | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 32                | 21                      | 30     | 5/10              | 1/4     | 25                  | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 35                | 27                      | 35     | 5/11              | 1/4     | 25                  | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 40                | 33                      | 44     | 8/14              | 1,3/4,5 | 25                  | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 45                | 39                      | 53     | 9/15              | 1,3/4,5 | 25                  | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 50                | 48                      | 68     | 9/18              | 1,5/5   | 25                  | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 63                | 83                      | 113    | 10/20             | 2/6     | 25                  | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |

## 1.8 Deep groove ball bearing with self-aligning ring single row (metric dimensions)

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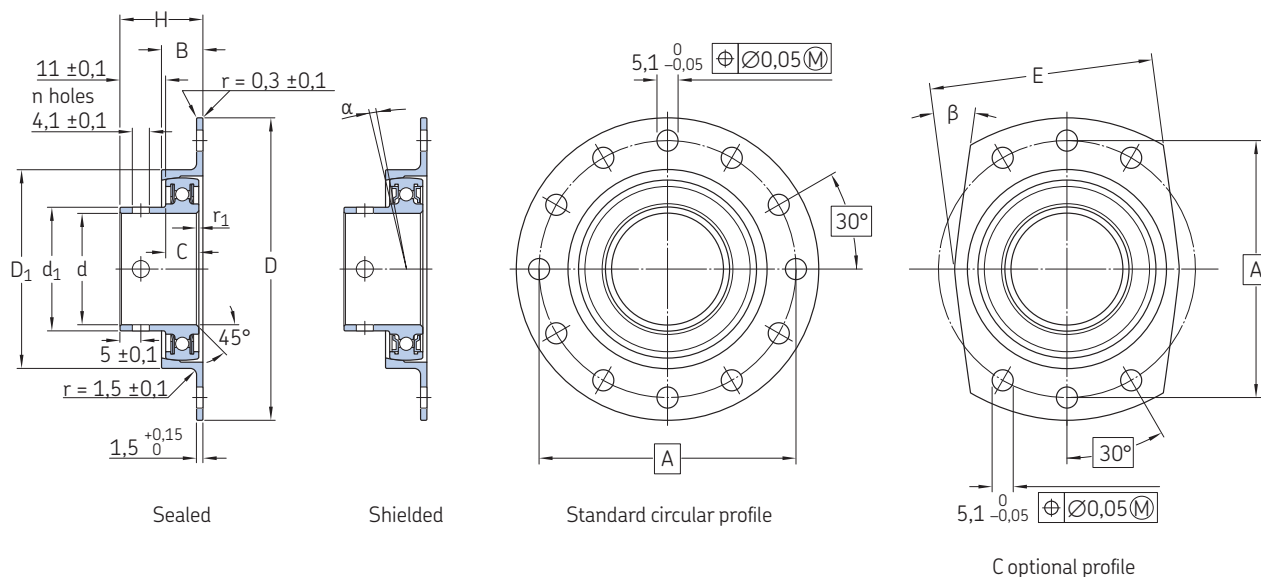
Technical  
specification

EN 3727

Product standard

EN 4041

1.8



### Dimensions

| Nominal bore code | Dimensions |                              |                         |        |        |   |                                      |                           |         |                       |    |         |                      |     |                          |      |         |
|-------------------|------------|------------------------------|-------------------------|--------|--------|---|--------------------------------------|---------------------------|---------|-----------------------|----|---------|----------------------|-----|--------------------------|------|---------|
| d                 | Δdmp       | For products per EN standard | For other products (J7) | Δds    | D ±0,2 | C | For products per EN standard 0/-0,12 | For other products 0/-0,1 | B ±0,15 | d <sub>1</sub> 0 -0,1 | A  | H ±0,15 | D <sub>1</sub> ±0,05 | n   | r <sub>1</sub> +0,3 -0,2 | E ±1 | α β ±1° |
| mm                | μm         |                              |                         |        | mm     |   |                                      |                           |         |                       |    |         |                      |     |                          |      | °       |
| 32                | 32         | 0/-12                        | +14/-11                 | +3/-15 | 77     | 7 | 7                                    | 9                         | 35      | 66                    | 19 | 52      | 4                    | 0,5 | 55                       | 2,5  | 24      |
| 35                | 35         | 0/-12                        | +14/-11                 | +3/-15 | 80     | 7 | 7                                    | 9                         | 38      | 69                    | 19 | 55      | 4                    | 0,5 | 58                       | 2,3  | 24      |
| 40                | 40         | 0/-12                        | +14/-11                 | +3/-15 | 86     | 8 | 8                                    | 10                        | 43      | 75                    | 20 | 61      | 4                    | 0,5 | 64                       | 2    | 30      |
| 45                | 45         | 0/-12                        | +14/-11                 | +3/-15 | 91     | 8 | 8                                    | 10                        | 48      | 80                    | 20 | 66      | 4                    | 0,5 | 68                       | 2    | 30      |
| 50                | 50         | 0/-12                        | +14/-11                 | +3/-15 | 97     | 8 | 8                                    | 10                        | 53      | 86                    | 20 | 72      | 6                    | 0,5 | 74                       | 1,7  | 30      |
| 63                | 63         | 0/-15                        | +18/-12                 | +4/-19 | 111    | 9 | 9                                    | 11                        | 67      | 100                   | 21 | 86      | 6                    | 0,5 | 90                       | 1,5  | 44      |

### Loads, clearance and torque

| Nominal bore code | Mass                      |                    | Static limit load     | Clearances |                              |                    | Maximum starting torque | Swivelling torque |
|-------------------|---------------------------|--------------------|-----------------------|------------|------------------------------|--------------------|-------------------------|-------------------|
|                   | Standard circular profile | C optional profile | Radial C <sub>s</sub> | Radial     | For products per EN standard | For other products | Shielded Sealed         | Standard Reduced  |
|                   | g                         |                    | kN                    | μm         |                              |                    | mNm                     | Nm                |
| 32                | 107                       | 91                 | 24,5                  | 2/7        | 5/13                         | 120                | 21 30                   | 5/10 1/4          |
| 35                | 125                       | 97                 | 25,5                  | 2/9        | 5/13                         | 120                | 27 35                   | 5/11 1/4          |
| 40                | 143                       | 121                | 29,5                  | 2/9        | 5/13                         | 120                | 33 44                   | 8/14 1,3/4,5      |
| 45                | 155                       | 136                | 32,4                  | 2/9        | 5/13                         | 120                | 39 53                   | 9/15 1,3/4,5      |
| 50                | 175                       | 152                | 35,3                  | 2/9        | 5/13                         | 120                | 48 68                   | 9/18 1,5/5        |
| 63                | 235                       | 205                | 39,2                  | 2/9        | 5/13                         | 120                | 83 113                  | 10/20 2/6         |



|                             |                                                |  |                                   |      |    |   |   |   |      |      |     |
|-----------------------------|------------------------------------------------|--|-----------------------------------|------|----|---|---|---|------|------|-----|
| Examples:                   | XTRCEI40TCDN741CP55R10<br>SWATRCEI32E          |  | X                                 | TRCE | 40 | T | C | D | N741 | CP55 | R10 |
| <b>Prefix code</b>          | <b>Material and surface treatment</b>          |  |                                   |      |    |   |   |   |      |      |     |
| <b>No code<sup>1)</sup></b> | <b>Ball bearing</b>                            |  | <b>Flanged self aligning ring</b> |      |    |   |   |   |      |      |     |
| <b>S<sup>1)</sup></b>       | Cadmium plated bearing steel <sup>2)</sup>     |  | Cadmium plated steel              |      |    |   |   |   |      |      |     |
| <b>WA<sup>1)</sup></b>      | Zinc-nickel plated bearing steel <sup>2)</sup> |  | Zinc-nickel plated steel          |      |    |   |   |   |      |      |     |
| <b>SWA<sup>1)</sup></b>     | Corrosion-resistant steel                      |  | Cadmium plated steel              |      |    |   |   |   |      |      |     |
| <b>X</b>                    | Corrosion-resistant steel                      |  | Zinc-nickel plated steel          |      |    |   |   |   |      |      |     |
|                             |                                                |  | Corrosion-resistant steel         |      |    |   |   |   |      |      |     |
| <b>Basic designation</b>    |                                                |  |                                   |      |    |   |   |   |      |      |     |
| <b>Bore code</b>            |                                                |  |                                   |      |    |   |   |   |      |      |     |
| <b>Shield and seal</b>      |                                                |  |                                   |      |    |   |   |   |      |      |     |
| <b>T</b>                    | Shielded                                       |  |                                   |      |    |   |   |   |      |      |     |
| <b>E</b>                    | Sealed                                         |  |                                   |      |    |   |   |   |      |      |     |
| <b>Flange profile</b>       |                                                |  |                                   |      |    |   |   |   |      |      |     |
| <b>No code</b>              | Standard circular profile                      |  |                                   |      |    |   |   |   |      |      |     |
| <b>C</b>                    | Optional profile                               |  |                                   |      |    |   |   |   |      |      |     |
| <b>Tolerances</b>           |                                                |  |                                   |      |    |   |   |   |      |      |     |
| <b>No code</b>              | Standard                                       |  |                                   |      |    |   |   |   |      |      |     |
| <b>D<sup>1)</sup></b>       | Precision                                      |  |                                   |      |    |   |   |   |      |      |     |
| <b>Variation</b>            |                                                |  |                                   |      |    |   |   |   |      |      |     |
| <b>No code<sup>1)</sup></b> | <b>Lubricant</b>                               |  | <b>Swivelling torque</b>          |      |    |   |   |   |      |      |     |
| <b>N741</b>                 | G354                                           |  | Standard                          |      |    |   |   |   |      |      |     |
| <b>N811</b>                 | G354                                           |  | Reduced                           |      |    |   |   |   |      |      |     |
|                             | G395                                           |  | Reduced                           |      |    |   |   |   |      |      |     |
| <b>Passivation</b>          |                                                |  |                                   |      |    |   |   |   |      |      |     |
| <b>No code</b>              | Not treated                                    |  |                                   |      |    |   |   |   |      |      |     |
| <b>CP55<sup>3)</sup></b>    | Passivated corrosion-resistant steel           |  |                                   |      |    |   |   |   |      |      |     |
| <b>Oversize</b>             |                                                |  |                                   |      |    |   |   |   |      |      |     |
| <b>No code</b>              | Standard outer diameter size                   |  |                                   |      |    |   |   |   |      |      |     |
| <b>R10</b>                  | 0,1 mm oversized outer diameter <sup>1)</sup>  |  |                                   |      |    |   |   |   |      |      |     |
| <b>R20</b>                  | 0,2 mm oversized outer diameter <sup>1)</sup>  |  |                                   |      |    |   |   |   |      |      |     |

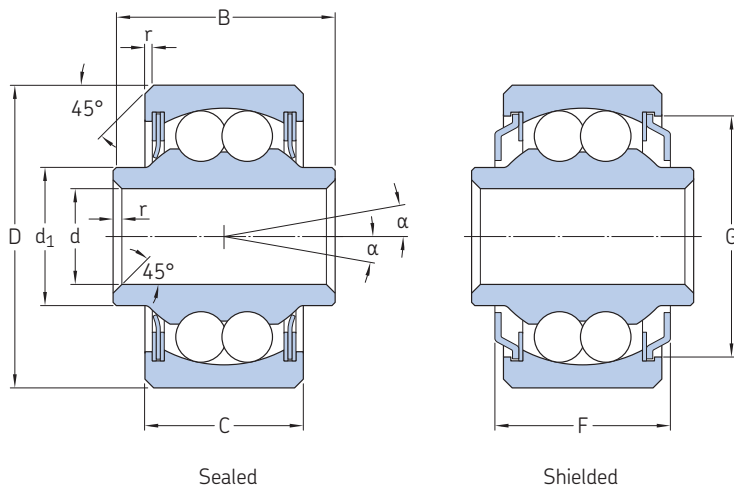
3) Available only for corrosion-resistant steel material without other surface treatment

| Nominal<br>bore<br>code | Tolerances                                        |           | Kea max<br>Standard | Precision | Sia max<br>Standard | Precision | Sea max<br>Standard | Precision |
|-------------------------|---------------------------------------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|
|                         | Kia max<br>Standard<br>Without self-aligning ring | Precision |                     |           |                     |           |                     |           |
| —                       | μm                                                |           |                     |           |                     |           |                     |           |
| 32                      | 25                                                | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 35                      | 25                                                | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 40                      | 25                                                | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 45                      | 25                                                | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 50                      | 25                                                | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |
| 63                      | 25                                                | 10        | 40                  | 10        | 40                  | 20        | 40                  | 20        |

## 1.9 Self-aligning ball bearing double row (metric dimensions)

KN..

1.9



Technical specification

EN 3280

Product standard

EN 3287 (Bearing steel)  
EN 3288 (Bearing steel  
cadmium plated)  
EN 3289 (Corrosion-  
resistant steel)

### Dimensions

| Nominal bore code |        | Dimensions |       |        |    |       |        |                 |                 | d <sub>1</sub><br>≈ | F<br>max | G<br>max | r<br>+0,3<br>-0,2 | α | Mass<br>≈ |
|-------------------|--------|------------|-------|--------|----|-------|--------|-----------------|-----------------|---------------------|----------|----------|-------------------|---|-----------|
| Shielded          | Sealed | d          | Δdmp  | Δds    | D  | ΔDmp  | ΔDs    | C<br>0<br>-0,12 | B<br>0<br>-0,12 |                     |          |          |                   |   |           |
| —                 |        | mm         | μm    |        | mm | μm    |        | mm              |                 |                     |          |          |                   | ° | g         |
| 5                 | 5      | 5          | 0/-8  | +2/-10 | 16 | 0/-8  | +2/-10 | 8               | 12              | 7,6                 | 10,0     | 12,0     | 0,5               | 6 | 9         |
| 6                 | 6      | 6          | 0/-8  | +2/-10 | 19 | 0/-9  | +2/-11 | 10              | 14              | 8,6                 | 12,0     | 14,4     | 0,5               | 6 | 14        |
| 8/24              | 8      | 8          | 0/-8  | +2/-10 | 24 | 0/-9  | +2/-11 | 10              | 15              | 11,1                | 13,0     | 19,8     | 0,5               | 6 | 30        |
| 10                | 10     | 10         | 0/-8  | +2/-10 | 30 | 0/-9  | +2/-11 | 14              | 20              | 13,6                | 17,0     | 24,0     | 0,5               | 6 | 57        |
| 12                | 12     | 12         | 0/-8  | +3/-11 | 32 | 0/-11 | +3/-14 | 14              | 20              | 15,4                | 17,0     | 26,5     | 0,5               | 6 | 62        |
| 15                | 15     | 15         | 0/-8  | +3/-11 | 35 | 0/-11 | +3/-14 | 14              | 20              | 18,5                | 17,0     | 30,0     | 0,5               | 6 | 75        |
| 17                | 17     | 17         | 0/-10 | +3/-11 | 40 | 0/-11 | +3/-14 | 16              | 22              | 21,2                | 19,0     | 34,0     | 0,5               | 6 | 110       |
| 20                | 20     | 20         | 0/-10 | +3/-13 | 47 | 0/-11 | +3/-14 | 18              | 24              | 23,6                | 20,0     | 39,7     | 0,5               | 6 | 170       |

### Tolerances, loads and torque

| Nominal bore code |        | Tolerances          |           |                     |           | Static limit loads |                | Maximum starting torque |        | Maximum swivelling torque |
|-------------------|--------|---------------------|-----------|---------------------|-----------|--------------------|----------------|-------------------------|--------|---------------------------|
| Shielded          | Sealed | Kia max<br>Standard | Precision | Kea max<br>Standard | Precision | Radial<br>$C_s$    | Axial<br>$C_a$ | Shielded                | Sealed |                           |
| —                 |        | $\mu m$             |           |                     |           | kN                 |                | mNm                     |        | Nm                        |
| 5                 | 5      | 25                  | 6         | 40                  | 8         | 3,9                | 1,2            | 4                       | 8      | 0,1                       |
| 6                 | 6      | 25                  | 6         | 40                  | 10        | 5,9                | 1,8            | 4,5                     | 9      | 0,1                       |
| 8/24              | 8      | 25                  | 6         | 40                  | 10        | 9,8                | 3,0            | 5,5                     | 10     | 0,1                       |
| 10                | 10     | 25                  | 6         | 40                  | 10        | 14,2               | 4,5            | 7,5                     | 12     | 0,1                       |
| 12                | 12     | 25                  | 7         | 40                  | 10        | 16,7               | 5,2            | 9                       | 14     | 0,1                       |
| 15                | 15     | 25                  | 7         | 40                  | 10        | 19                 | 5,9            | 12                      | 18     | 0,1                       |
| 17                | 17     | 25                  | 7         | 40                  | 10        | 24,5               | 7,7            | 18                      | 25     | 0,1                       |
| 20                | 20     | 25                  | 8         | 40                  | 10        | 34,3               | 10,7           | 23                      | 35     | 0,1                       |



## Designation system

Examples: ZWKN10EDN743CP55R10  
KN 6N745

### Surface treatment

**No code** Not plated steel  
**Z** Cadmium plated steel  
**SZ<sup>1)</sup>** Zinc-nickel plated steel

### Material

**No code** Bearing steel  
**W** Corrosion-resistant steel

### Basic designation

### Bore code

### Shield and seal

**No code** Shielded  
**E** Sealed

### Tolerances

**No code** Standard  
**D<sup>1)</sup>** Precision

### Variation

**J6-12 (for bore code ≤ 6)<sup>1)</sup>**

**J8-14 (for bore code 8 to 15)<sup>1)</sup>**

**J10-17 (for bore code ≥ 17)<sup>1)</sup>**

**J6-12G81 (for bore code ≤ 6)<sup>1)</sup>**

**J8-14G81 (for bore code 8 to 15)<sup>1)</sup>**

**J10-17G81 (for bore code ≥ 17)<sup>1)</sup>**

**N745<sup>2)</sup>**

**N815**

**N813<sup>3)</sup>**

**N743<sup>4)</sup>**

**N746<sup>5)</sup>**

**N816<sup>6)</sup>**

### Lubricant

G354

G354

G354

G395

G395

G395

G354

G395

G395

G354

G354

G395

### Clearances

Increased radial

Increased radial

Increased radial

Increased radial

Increased radial

Increased radial

Reduced radial and axial

Reduced radial and axial

Standard radial and axial

Standard radial and axial

Group 3 radial and axial

Group 3 radial and axial

### Passivation

**No code** Not treated  
**CP55<sup>7)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**R10<sup>1)</sup>** 0,1 mm oversized outer diameter  
**R20<sup>1)</sup>** 0,2 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> Replaces no code, <sup>3)</sup> Replaces N811, <sup>4)</sup> Replaces N741, <sup>5)</sup> Replaces N742, <sup>6)</sup> Replaces N812

<sup>7)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Clearance

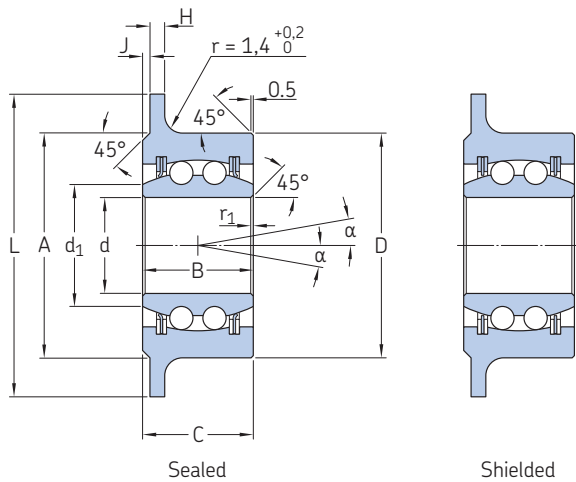
### Nominal bore code Clearances

| Shielded    | Sealed    | Standard Radial | Axial max | Reduced Radial | Axial max | Group 3 Radial | Axial max | Increased Radial |
|-------------|-----------|-----------------|-----------|----------------|-----------|----------------|-----------|------------------|
| –           |           | µm              |           |                |           |                |           |                  |
| <b>5</b>    | <b>5</b>  | 2/13            | 100       | 2/6            | 70        | 10/20          | 100       | 6/12             |
| <b>6</b>    | <b>6</b>  | 2/13            | 100       | 2/6            | 70        | 10/20          | 100       | 6/12             |
| <b>8/24</b> | <b>8</b>  | 2/13            | 100       | 2/7            | 80        | 10/20          | 100       | 8/14             |
| <b>10</b>   | <b>10</b> | 2/13            | 120       | 2/7            | 80        | 10/20          | 120       | 8/14             |
| <b>12</b>   | <b>12</b> | 3/18            | 120       | 3/9            | 80        | 13/23          | 120       | 8/14             |
| <b>15</b>   | <b>15</b> | 3/18            | 120       | 3/9            | 80        | 13/23          | 120       | 8/14             |
| <b>17</b>   | <b>17</b> | 3/18            | 160       | 3/9            | 80        | 13/23          | 160       | 10/17            |
| <b>20</b>   | <b>20</b> | 5/20            | 180       | 5/10           | 80        | 15/25          | 180       | 10/17            |

## 1.10 Self-aligning ball bearing double row (metric dimensions)

KNRCE..

Technical specification EN 3280  
Product standard EN 4034



### Dimensions and tolerances

| Nominal bore code | Dimensions |       |        |    |       |        |            |            |                |    |    |   |     |                |       | Mass |
|-------------------|------------|-------|--------|----|-------|--------|------------|------------|----------------|----|----|---|-----|----------------|-------|------|
|                   | d          | Δdmp  | Δds    | D  | ΔDmp  | ΔDs    | C          | B          | d <sub>1</sub> | A  | L  | J | H   | r <sub>1</sub> | α     | ≈    |
|                   | mm         | μm    |        | mm | μm    |        | 0<br>-0,12 | 0<br>-0,12 | ≈              | ≈  | ≈  | ≈ |     | +0,3<br>0      | °     | g    |
| 15                | 15         | 0/-8  | +3/-11 | 33 | 0/-11 | +3/-14 | 13         | 13         | 19,6           | 34 | 41 | 1 | 1,5 | 0,2            | 2°30' | 61   |
| 16                | 16         | 0/-8  | +3/-11 | 33 | 0/-11 | +3/-14 | 13         | 13         | 19,6           | 34 | 41 | 1 | 1,5 | 0,2            | 2°30' | 58   |
| 20                | 20         | 0/-9  | +3/-13 | 38 | 0/-13 | +3/-14 | 13         | 13         | 24,7           | 39 | 46 | 1 | 1,5 | 0,2            | 2°30' | 74   |
| 25                | 25         | 0/-10 | +3/-13 | 43 | 0/-13 | +3/-14 | 14         | 14         | 28,6           | 44 | 51 | 1 | 1,5 | 0,2            | 2°30' | 90   |
| 32                | 32         | 0/-10 | +3/-13 | 52 | 0/-13 | +4/-17 | 14         | 14         | 38,0           | 55 | 60 | 2 | 2   | 0,2            | 2°30' | 132  |
| 35 <sup>1)</sup>  | 35         | 0/-11 | +3/-15 | 55 | 0/-15 | +4/-17 | 14         | 14         | 40,6           | 58 | 63 | 2 | 2   | 0,2            | 2°30' | 141  |
| 40 <sup>1)</sup>  | 40         | 0/-11 | +3/-15 | 61 | 0/-15 | +4/-17 | 16         | 16         | 45,3           | 64 | 69 | 2 | 2   | 0,2            | 2°30' | 183  |

### Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances |           | Kea max  |           | Static limit loads    |                      | Radial clearance | Maximum starting torque |        | Maximum swivelling torque |
|-------------------|------------|-----------|----------|-----------|-----------------------|----------------------|------------------|-------------------------|--------|---------------------------|
|                   | Kia max    | Precision | Standard | Precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> |                  | Shielded                | Sealed |                           |
|                   | μm         |           |          |           | kN                    |                      | μm               | mNm                     |        | Nm                        |
| 15                | 25         | 7         | 40       | 10        | 15,7                  | 5,3                  | 3/9              | 12                      | 18     | 0,1                       |
| 16                | 25         | 7         | 40       | 10        | 15,7                  | 5,3                  | 3/9              | 12                      | 18     | 0,1                       |
| 20                | 25         | 8         | 40       | 10        | 19                    | 5,3                  | 5/10             | 23                      | 35     | 0,1                       |
| 25                | 25         | 8         | 40       | 10        | 21,6                  | 5,3                  | 5/10             | 30                      | 42     | 0,1                       |
| 32                | 25         | 8         | 40       | 10        | 27,5                  | 5,3                  | 10/18            | 40                      | 55     | 0,1                       |
| 35 <sup>1)</sup>  | 25         | 10        | 40       | 10        | 29,1                  | 5,3                  | 10/18            | 44                      | 66     | 0,15                      |
| 40 <sup>1)</sup>  | 25         | 10        | 40       | 10        | 32,5                  | 5,3                  | 10/18            | 50                      | 75     | 0,15                      |

<sup>1)</sup> SKF option



## Designation system

Examples: ZWKNRCE20EDN743CP55R10  
KNRCE15N813

### Surface treatment

**No code** Not plated steel  
**Z<sup>1)</sup>** Cadmium plated steel  
**SZ<sup>1)</sup>** Zinc-nickel plated steel

### Material

**No code<sup>1)</sup>** Bearing steel  
**W** Corrosion-resistant steel

### Basic designation

### Bore code

### Shield and seal

**No code** Shielded  
**E** Sealed

### Tolerances

**No code** Standard  
**D<sup>1)</sup>** Precision

### Variation

**N743<sup>2)</sup>** **Lubricant**  
**N813** G354  
G395

### Passivation

**No code** Not treated  
**CP55<sup>3)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**R10<sup>1)</sup>** 0,1 mm oversized outer diameter  
**R20<sup>1)</sup>** 0,2 mm oversized outer diameter

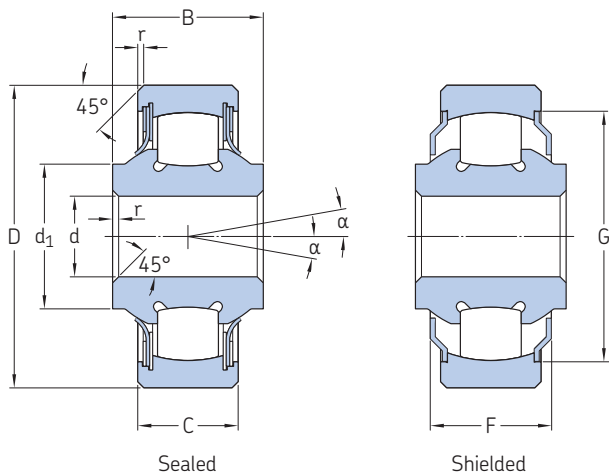
<sup>1)</sup> SKF option

<sup>2)</sup> Replaces no code

<sup>3)</sup> Available only for corrosion-resistant steel material without other surface treatment

## 1.11 Spherical roller bearing single row (metric dimensions)

K..F, KN..F, K..FE..SP1, KN..FE..SP1



Technical specification

EN 3280

Product standard

EN 3053 (Bearing steel)  
EN 3054 (Bearing steel  
cadmium plated)  
EN 3055 (Corrosion-  
resistant steel)

### Dimensions

| Nominal bore code |            | Dimensions |              | $\Delta ds$ | D  | $\Delta Dmp$ | $\Delta Ds$ | C  | B  | $d_1 \approx$ | F max | G max | r   | $\alpha$ |     |
|-------------------|------------|------------|--------------|-------------|----|--------------|-------------|----|----|---------------|-------|-------|-----|----------|-----|
| Shielded          | Sealed     | d          | $\Delta dmp$ |             |    |              |             |    |    |               |       |       |     |          |     |
|                   |            | mm         | $\mu m$      |             | mm | $\mu m$      |             | mm | mm |               |       |       |     | °        |     |
| 6                 | –          | 6          | 0/–8         | +2/–10      | 24 | 0/–9         | +2/–11      | 8  | 12 | 11,9          | 10    | 20,5  | 0,5 | 6        | –   |
| 8                 | 8FE..SP1   | 8          | 0/–8         | +2/–10      | 26 | 0/–9         | +2/–11      | 10 | 15 | 12,3          | 13    | 22    | 0,5 | 6        | 4   |
| N 8               | N 8FE..SP1 | 8          | 0/–8         | +2/–10      | 30 | 0/–9         | +2/–11      | 10 | 15 | 14,3          | 12    | 25    | 0,5 | 6        | 1,5 |
| 10                | –          | 10         | 0/–8         | +2/–10      | 35 | 0/–11        | +3/–14      | 12 | 16 | 16,9          | 13    | 29    | 0,5 | 6        | –   |
| N10               | –          | 10         | 0/–8         | +2/–10      | 35 | 0/–11        | +3/–14      | 12 | 20 | 16,9          | 17    | 29    | 0,5 | 6        | –   |
| N12               | –          | 12         | 0/–8         | +3/–11      | 40 | 0/–11        | +3/–14      | 13 | 20 | 19,9          | 17    | 33,5  | 0,5 | 6        | –   |
| N15               | –          | 15         | 0/–8         | +3/–11      | 47 | 0/–11        | +3/–14      | 14 | 24 | 23,9          | 20    | 40    | 0,5 | 6        | –   |
| 17                | –          | 17         | 0/–8         | +3/–11      | 47 | 0/–11        | +3/–14      | 15 | 24 | 25,9          | 20    | 41    | 0,5 | 6        | –   |

### Tolerances, loads, clearance and torque

| Nominal bore code |            | Mass<br>$\approx$ | Tolerances |           | Kea max  |           | Static limit loads |                | Clearances |           | Maximum starting torque |
|-------------------|------------|-------------------|------------|-----------|----------|-----------|--------------------|----------------|------------|-----------|-------------------------|
| Shielded          | Sealed     |                   | Kia max    | Precision | Standard | Precision | Radial<br>$C_s$    | Axial<br>$C_a$ | Radial     | Axial max |                         |
|                   |            | g                 | $\mu m$    |           |          |           | kN                 |                | $\mu m$    |           | mNm                     |
| 6                 | –          | 21                | 25         | 6         | 40       | 10        | 15,9               | 4,8            | 2/6        | 180       | 6                       |
| 8                 | 8FE..SP1   | 37                | 25         | 6         | 40       | 10        | 22,8               | 6,9            | 2/7        | 210       | 8                       |
| N 8               | N 8FE..SP1 | 49                | 25         | 6         | 40       | 10        | 27,8               | 8,4            | 2/7        | 210       | 12                      |
| 10                | –          | 70                | 25         | 6         | 40       | 10        | 32,9               | 10,0           | 2/7        | 210       | 16                      |
| N10               | –          | 72                | 25         | 6         | 40       | 10        | 32,9               | 10,0           | 2/7        | 210       | 16                      |
| N12               | –          | 108               | 25         | 7         | 40       | 10        | 45                 | 13,6           | 3/9        | 210       | 20                      |
| N15               | –          | 153               | 25         | 7         | 40       | 10        | 54,2               | 16,4           | 3/9        | 210       | 25                      |
| 17                | –          | 163               | 25         | 7         | 40       | 10        | 69,4               | 21,0           | 3/9        | 210       | 30                      |



## Designation system

|                                        |                                                     |   |   |   |    |   |   |   |     |      |     |
|----------------------------------------|-----------------------------------------------------|---|---|---|----|---|---|---|-----|------|-----|
| Examples:                              | ZWK10FEDSP1CP55R10                                  | Z | W | K | 10 | F | E | D | SP1 | CP55 | R10 |
|                                        | KN 8FN743                                           |   |   |   |    |   |   |   |     |      |     |
| <b>Surface treatment of outer ring</b> |                                                     |   |   |   |    |   |   |   |     |      |     |
| <b>No code</b>                         | Not plated                                          |   |   |   |    |   |   |   |     |      |     |
| <b>Z</b>                               | Cadmium plated external dimensions                  |   |   |   |    |   |   |   |     |      |     |
| <b>SZ<sup>1)</sup></b>                 | Zinc-nickel plated external dimensions              |   |   |   |    |   |   |   |     |      |     |
| <b>Material</b>                        |                                                     |   |   |   |    |   |   |   |     |      |     |
| <b>No code</b>                         | Bearing steel inner ring and outer ring             |   |   |   |    |   |   |   |     |      |     |
| <b>W</b>                               | Corrosion-resistant steel inner ring and outer ring |   |   |   |    |   |   |   |     |      |     |
| <b>Basic designation</b>               |                                                     |   |   |   |    |   |   |   |     |      |     |
| <b>Bore code</b>                       |                                                     |   |   |   |    |   |   |   |     |      |     |
| <b>Tolerances</b>                      |                                                     |   |   |   |    |   |   |   |     |      |     |
| <b>No code</b>                         | Standard                                            |   |   |   |    |   |   |   |     |      |     |
| <b>D<sup>1)</sup></b>                  | Precision                                           |   |   |   |    |   |   |   |     |      |     |
| <b>Variation</b>                       |                                                     |   |   |   |    |   |   |   |     |      |     |
|                                        | <b>Shield and seal</b>                              |   |   |   |    |   |   |   |     |      |     |
| <b>N743<sup>2)</sup></b>               | Shielded                                            |   |   |   |    |   |   |   |     |      |     |
| <b>N813</b>                            | Shielded                                            |   |   |   |    |   |   |   |     |      |     |
| <b>E..SP1<sup>1)4)</sup></b>           | Sealed                                              |   |   |   |    |   |   |   |     |      |     |
| <b>E..SP1G81<sup>1)4)</sup></b>        | Sealed                                              |   |   |   |    |   |   |   |     |      |     |
| <b>Passivation</b>                     |                                                     |   |   |   |    |   |   |   |     |      |     |
| <b>No code</b>                         | Not treated                                         |   |   |   |    |   |   |   |     |      |     |
| <b>CP55<sup>3)</sup></b>               | Passivated corrosion-resistant steel                |   |   |   |    |   |   |   |     |      |     |
| <b>Oversize</b>                        |                                                     |   |   |   |    |   |   |   |     |      |     |
| <b>No code</b>                         | Standard outer diameter size                        |   |   |   |    |   |   |   |     |      |     |
| <b>R10<sup>1)</sup></b>                | 0,1 mm oversized outer diameter                     |   |   |   |    |   |   |   |     |      |     |
| <b>R20<sup>1)</sup></b>                | 0,2 mm oversized outer diameter                     |   |   |   |    |   |   |   |     |      |     |

<sup>1)</sup> SKF option

<sup>2)</sup> Replaces no code,

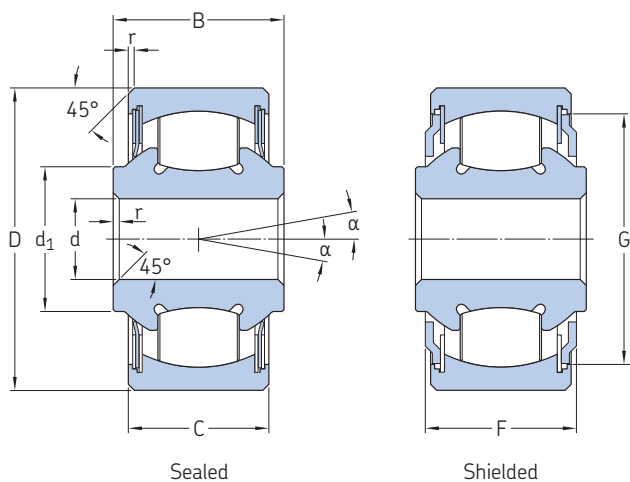
<sup>3)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

<sup>4)</sup> Only available for bore code 8 and N8

## 1.12 Spherical roller bearing single row (metric dimensions)

KNA..F

1.12



Technical specification

EN 3280

Product standard

EN 3290 (Bearing steel)  
EN 3291 (Bearing steel  
cadmium plated)  
EN 3292 (Corrosion-  
resistant steel)

### Dimensions

| Nominal<br>bore<br>code | Dimensions<br>d | Δdmp  | Δds    | D  | ΔDmp  | ΔDs    | C<br>0<br>-0,12 | B<br>0<br>-0,12 | d <sub>1</sub><br>≈ | F<br>max | G<br>max | r<br>+0,3<br>-0,2 | α | Mass<br>≈ |
|-------------------------|-----------------|-------|--------|----|-------|--------|-----------------|-----------------|---------------------|----------|----------|-------------------|---|-----------|
| –                       | mm              | μm    |        | mm | μm    |        | mm              |                 |                     |          |          |                   | ° | g         |
| 8                       | 8               | 0/-8  | +2/-10 | 30 | 0/-9  | +3/-14 | 14              | 17              | 14                  | 14       | 24,9     | 0,5               | 7 | 58        |
| 10                      | 10              | 0/-8  | +2/-10 | 35 | 0/-11 | +3/-14 | 17              | 21              | 15,7                | 18       | 28       | 0,5               | 7 | 91        |
| 12                      | 12              | 0/-8  | +3/-11 | 37 | 0/-11 | +3/-14 | 17              | 21              | 18                  | 18       | 30,7     | 0,5               | 7 | 106       |
| 15                      | 15              | 0/-8  | +3/-11 | 42 | 0/-11 | +3/-14 | 17              | 21              | 21,8                | 18       | 35,5     | 0,5               | 7 | 132       |
| 17                      | 17              | 0/-8  | +3/-11 | 47 | 0/-11 | +4/-14 | 19              | 23              | 25,1                | 19       | 39,3     | 0,5               | 7 | 186       |
| 20                      | 20              | 0/-8  | +3/-13 | 52 | 0/-13 | +4/-17 | 21              | 26              | 28                  | 22       | 44,8     | 0,5               | 7 | 246       |
| 25                      | 25              | 0/-10 | +3/-13 | 62 | 0/-13 | +4/-17 | 24              | 29              | 34,5                | 25       | 53,3     | 0,5               | 7 | 397       |
| 30                      | 30              | 0/-10 | +3/-13 | 72 | 0/-13 | +4/-17 | 27              | 34              | 41,3                | 30       | 63       | 0,5               | 7 | 610       |

### Tolerances, loads, clearance and torque

| Nominal<br>bore<br>code | Tolerances          |           | Kea max  |           | Static limit loads       |                         | Clearances         |       | Reduced |       | Maximum starting torque |        |
|-------------------------|---------------------|-----------|----------|-----------|--------------------------|-------------------------|--------------------|-------|---------|-------|-------------------------|--------|
| –                       | Kia max<br>Standard | Precision | Standard | Precision | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | Standard<br>Radial | Axial | Radial  | Axial | Shielded                | Sealed |
| –                       | μm                  |           |          |           | kN                       |                         | μm                 |       |         |       | mNm                     |        |
| 8                       | 25                  | 6         | 40       | 10        | 41,2                     | 12,4                    | 10/20              | 230   | 2/7     | 190   | 7                       | 11     |
| 10                      | 25                  | 6         | 40       | 10        | 58,8                     | 17,7                    | 10/20              | 230   | 2/7     | 190   | 10                      | 15,5   |
| 12                      | 25                  | 7         | 40       | 10        | 68,6                     | 20,6                    | 10/20              | 240   | 3/9     | 200   | 15                      | 23     |
| 15                      | 25                  | 7         | 40       | 10        | 70,6                     | 21,2                    | 10/20              | 240   | 3/9     | 200   | 20                      | 30     |
| 17                      | 25                  | 7         | 40       | 10        | 95                       | 28,6                    | 10/20              | 240   | 3/9     | 200   | 25                      | 38     |
| 20                      | 25                  | 8         | 40       | 10        | 114                      | 34,3                    | 10/20              | 250   | 3/10    | 220   | 30                      | 45     |
| 25                      | 25                  | 8         | 40       | 10        | 162,5                    | 49                      | 15/25              | 290   | 3/10    | 240   | 35                      | 52     |
| 30                      | 25                  | 8         | 40       | 10        | 217,6                    | 65,3                    | 15/25              | 290   | 3/10    | 240   | 40                      | 60     |





## Designation system

|                          |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---|---|-----|----|---|---|---|------|------|-----|
| Examples:                | ZWKNA10FEDN743CP55R10                                                                                                               | Z | W | KNA | 10 | F | E | D | N743 | CP55 | R10 |
|                          | KNA 8FN813                                                                                                                          |   |   |     |    |   |   |   |      |      |     |
| <b>Surface treatment</b> |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>No code</b>           | Not plated steel                                                                                                                    |   |   |     |    |   |   |   |      |      |     |
| <b>Z</b>                 | Cadmium plated steel                                                                                                                |   |   |     |    |   |   |   |      |      |     |
| <b>SZ<sup>1)</sup></b>   | Zinc-nickel plated steel                                                                                                            |   |   |     |    |   |   |   |      |      |     |
| <b>Material</b>          |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>No code</b>           | Bearing steel                                                                                                                       |   |   |     |    |   |   |   |      |      |     |
| <b>W</b>                 | Corrosion-resistant steel                                                                                                           |   |   |     |    |   |   |   |      |      |     |
| <b>Basic designation</b> |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>Bore code</b>         |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>Shield and seal</b>   |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>No code</b>           | Shielded                                                                                                                            |   |   |     |    |   |   |   |      |      |     |
| <b>E</b>                 | Sealed                                                                                                                              |   |   |     |    |   |   |   |      |      |     |
| <b>Tolerances</b>        |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>No code</b>           | Standard                                                                                                                            |   |   |     |    |   |   |   |      |      |     |
| <b>D<sup>1)</sup></b>    | Precision                                                                                                                           |   |   |     |    |   |   |   |      |      |     |
| <b>Variation</b>         |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>N745<sup>2)</sup></b> | <b>Lubricant</b><br>G354                                                                                                            |   |   |     |    |   |   |   |      |      |     |
| <b>N815</b>              | G395                                                                                                                                |   |   |     |    |   |   |   |      |      |     |
| <b>N813<sup>3)</sup></b> | G395                                                                                                                                |   |   |     |    |   |   |   |      |      |     |
| <b>N743<sup>4)</sup></b> | G354                                                                                                                                |   |   |     |    |   |   |   |      |      |     |
|                          | <b>Clearances</b><br>Reduced radial and axial<br>Reduced radial and axial<br>Standard radial and axial<br>Standard radial and axial |   |   |     |    |   |   |   |      |      |     |
| <b>Passivation</b>       |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>No code</b>           | Not treated                                                                                                                         |   |   |     |    |   |   |   |      |      |     |
| <b>CP55<sup>5)</sup></b> | Passivated corrosion-resistant steel                                                                                                |   |   |     |    |   |   |   |      |      |     |
| <b>Oversize</b>          |                                                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>No code</b>           | Standard outer diameter size                                                                                                        |   |   |     |    |   |   |   |      |      |     |
| <b>R10<sup>1)</sup></b>  | 0,1 mm oversized outer diameter                                                                                                     |   |   |     |    |   |   |   |      |      |     |
| <b>R20<sup>1)</sup></b>  | 0,2 mm oversized outer diameter                                                                                                     |   |   |     |    |   |   |   |      |      |     |

<sup>1)</sup> SKF option

<sup>2)</sup> Replaces no code

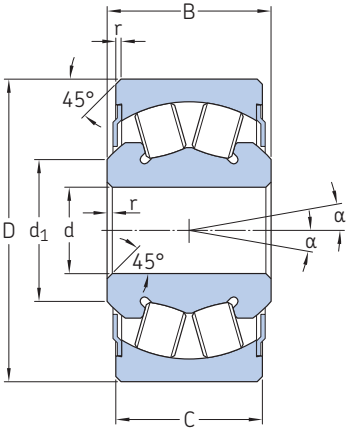
<sup>3)</sup> Replaces N811

<sup>4)</sup> Replaces N741

<sup>5)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

1.13 Spherical roller bearing double row (metric dimensions)

K..D



|                         |   |
|-------------------------|---|
| Technical specification | – |
| Product standard        | – |

Dimension

| Nominal bore code | Dimensions |              | $\Delta ds$ | D  | $\Delta Dmp$ | $\Delta Ds$ | C<br>0<br>–0,12 | B<br>0<br>–0,12 | $d_1 \approx$ | r<br>+0,3<br>–0,2 | $\alpha$ | Mass<br>$\approx$ |
|-------------------|------------|--------------|-------------|----|--------------|-------------|-----------------|-----------------|---------------|-------------------|----------|-------------------|
|                   | d          | $\Delta dmp$ |             |    |              |             |                 |                 |               |                   |          |                   |
| –                 | mm         | $\mu m$      |             | mm | $\mu m$      |             | mm              |                 |               |                   | °        | g                 |
| 10/21             | 10         | 0/–8         | +2/–10      | 35 | 0/–11        | +3/–14      | 17              | 21              | 17,4          | 0,5               | 5        | 95                |
| 10                | 10         | 0/–8         | +2/–10      | 35 | 0/–11        | +3/–14      | 17              | 24              | 17,4          | 0,5               | 5        | 113               |
| 12/21             | 12         | 0/–8         | +3/–11      | 35 | 0/–11        | +3/–14      | 17              | 21              | 17,4          | 0,5               | 5        | 90                |

Tolerances, loads, clearance and torque

| Nominal bore code | Tolerances |         | Static limit loads |                | Axial clearance | Maximum starting torque |
|-------------------|------------|---------|--------------------|----------------|-----------------|-------------------------|
|                   | Kia max    | Kea max | Radial<br>$C_s$    | Axial<br>$C_a$ |                 |                         |
| –                 | $\mu m$    |         | kN                 |                | $\mu m$         | mNm                     |
| 10/21             | 25         | 40      | 54,3               | 16,3           | 0/300           | 30                      |
| 10                | 25         | 40      | 54,3               | 16,3           | 0/300           | 30                      |
| 12/21             | 25         | 40      | 54,3               | 16,3           | 0/300           | 30                      |



## Designation system

Examples: ZWK10/21DG81CP55R10  
K10D

### Surface treatment

**No code** Not plated steel  
**Z** Cadmium plated steel  
**SZ** Zinc-nickel plated steel

### Material

**No code** Bearing steel  
**W** Corrosion-resistant steel

### Basic designation

#### Bore code

#### Lubrication

**No code** Grease G354  
**G81** Grease G395

#### Passivation

**No code** Not treated  
**CP55<sup>1)</sup>** Passivated corrosion-resistant steel

#### Oversize

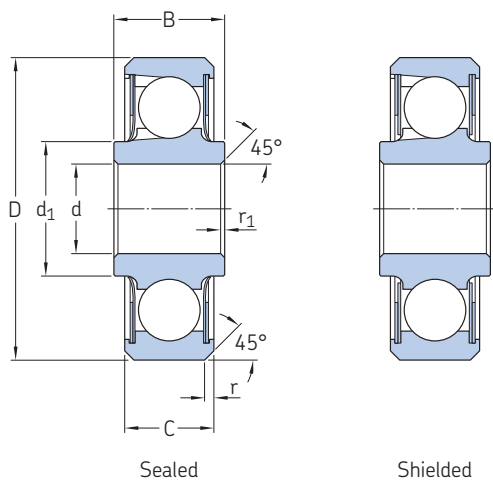
**No code** Standard outer diameter size  
**R10** 0,1 mm oversized outer diameter  
**R20** 0,2 mm oversized outer diameter

<sup>1)</sup> Available only for corrosion-resistant steel material without other surface treatment

## 1.14 Deep groove ball bearing single row (inch dimensions)

KP., KP..L

Technical specification AS 7949  
Product standard AS 27640



### Dimensions

| Nominal<br>bore<br>code | Dimensions |                  |                        | Δds             | D      | ΔDmp      |                        | ΔDs             | C      | ΔCs      |                        |
|-------------------------|------------|------------------|------------------------|-----------------|--------|-----------|------------------------|-----------------|--------|----------|------------------------|
|                         | d          | Δdmp<br>Standard | SKF super<br>precision |                 |        | Standard  | SKF super<br>precision |                 |        | Standard | SKF super<br>precision |
| –                       | in/mm      |                  |                        |                 |        |           |                        |                 |        |          |                        |
| 3L                      | 0.1900     | 0/−0.0005        | 0/−0.0003              | +0.0002/−0.0007 | 0.6250 | 0/−0.0005 | 0/−0.0004              | +0.0005/−0.0010 | 0,203  | 0/−0.005 | 0/−0.005               |
|                         | 4,826      | 0/−0,0127        | 0/−0,0076              | +0,0050/−0,0178 | 15,875 | 0/−0,0127 | 0/−0,0101              | +0,0127/−0,0254 | 5,156  | 0/−0,127 | 0/−0,127               |
| 3                       | 0.1900     | 0/−0.0005        | 0/−0.0003              | +0.0002/−0.0007 | 0.7774 | 0/−0.0005 | 0/−0.0004              | +0.0005/−0.0010 | 0.270  | 0/−0.005 | 0/−0.005               |
|                         | 4,826      | 0/−0,0127        | 0/−0,0076              | +0,0050/−0,0178 | 19,745 | 0/−0,0127 | 0/−0,0101              | +0,0127/−0,0254 | 6,858  | 0/−0,127 | 0/−0,127               |
| 4                       | 0.2500     | 0/−0.0005        | 0/−0.0003              | +0.0002/−0.0007 | 0.9014 | 0/−0.0005 | 0/−0.0004              | +0.0005/−0.0010 | 0.335  | 0/−0.005 | 0/−0.005               |
|                         | 6,350      | 0/−0,0127        | 0/−0,0076              | +0,0050/−0,0178 | 22,895 | 0/−0,0127 | 0/−0,0101              | +0,0127/−0,0254 | 8,509  | 0/−0,127 | 0/−0,127               |
| 5                       | 0.3125     | 0/−0.0005        | 0/−0.0003              | +0.0002/−0.0007 | 1.2500 | 0/−0.0005 | 0/−0.0004              | +0.0005/−0.0010 | 0.375  | 0/−0.005 | 0/−0.005               |
|                         | 7,938      | 0/−0,0127        | 0/−0,0076              | +0,0050/−0,0178 | 31,750 | 0/−0,0127 | 0/−0,0101              | +0,0127/−0,0254 | 9,525  | 0/−0,127 | 0/−0,127               |
| 6                       | 0.3750     | 0/−0.0005        | 0/−0.0003              | +0.0002/−0.0007 | 1.4375 | 0/−0.0005 | 0/−0.0004              | +0.0005/−0.0010 | 0.469  | 0/−0.005 | 0/−0.005               |
|                         | 9,525      | 0/−0,0127        | 0/−0,0076              | +0,0050/−0,0178 | 36,513 | 0/−0,0127 | 0/−0,0101              | +0,0127/−0,0254 | 11,912 | 0/−0,127 | 0/−0,127               |
| 8                       | 0.5000     | 0/−0.0005        | 0/−0.0003              | +0.0002/−0.0007 | 1.6875 | 0/−0.0005 | 0/−0.0004              | +0.0005/−0.0010 | 0.500  | 0/−0.005 | 0/−0.005               |
|                         | 12,700     | 0/−0,0127        | 0/−0,0076              | +0,0050/−0,0178 | 42,862 | 0/−0,0127 | 0/−0,0101              | +0,0127/−0,0254 | 12,700 | 0/−0,127 | 0/−0,127               |
| 10                      | 0.6250     | 0/−0.0005        | 0/−0.0003              | +0.0002/−0.0007 | 1.9375 | 0/−0.0005 | 0/−0.0004              | +0.0005/−0.0010 | 0.500  | 0/−0.005 | 0/−0.005               |
|                         | 15,875     | 0/−0,0127        | 0/−0,0076              | +0,0050/−0,0178 | 49,212 | 0/−0,0127 | 0/−0,0101              | +0,0127/−0,0254 | 12,700 | 0/−0,127 | 0/−0,127               |

### Dimensions cont. and tolerances

| Nominal<br>bore<br>code | Dimensions |                 |                        |                     |                                        |                           | Mass<br>≈ | Tolerances          |                        |                     |                        |                     |                        |
|-------------------------|------------|-----------------|------------------------|---------------------|----------------------------------------|---------------------------|-----------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|
|                         | B          | ΔBs<br>Standard | SKF super<br>precision | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0,015/0<br>+0,381/0 | r<br>+0.015/0<br>+0,381/0 |           | Kia max<br>Standard | SKF super<br>precision | Kea max<br>Standard | SKF super<br>precision | Sia max<br>Standard | SKF super<br>precision |
| –                       | in/mm      |                 |                        |                     |                                        |                           | lb/g      | in/mm               |                        |                     |                        |                     |                        |
| 3L                      | 0.245      | 0/–0.005        | 0/–0.0025              | 0.280               | 0.005                                  | 0.010                     | 0.01      | 0.0010              | 0.0005                 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |
|                         | 6,223      | 0/–0,127        | 0/–0,0635              | 7,112               | 0,127                                  | 0,254                     | 4,5       | 0,0254              | 0,0127                 | 0,0406              | 0,0203                 | 0,0254              | 0,0178                 |
| 3                       | 0.297      | 0/–0.005        | 0/–0.0025              | 0.331               | 0.005                                  | 0.022                     | 0.03      | 0.0010              | 0.0005                 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |
|                         | 7,543      | 0/–0,127        | 0/–0,0635              | 8,407               | 0,127                                  | 0,559                     | 14        | 0,0254              | 0,0127                 | 0,0406              | 0,0203                 | 0,0254              | 0,0178                 |
| 4                       | 0.484      | 0/–0.005        | 0/–0.0025              | 0.390               | 0.005                                  | 0.032                     | 0.04      | 0.0010              | 0.0005                 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |
|                         | 12,293     | 0/–0,127        | 0/–0,0635              | 9,906               | 0,127                                  | 0,813                     | 18        | 0,0254              | 0,0127                 | 0,0406              | 0,0203                 | 0,0254              | 0,0178                 |
| 5                       | 0.558      | 0/–0.005        | 0/–0.0025              | 0.469               | 0.015                                  | 0.032                     | 0.09      | 0.0010              | 0.0005                 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |
|                         | 14,173     | 0/–0,127        | 0/–0,0635              | 11,912              | 0,381                                  | 0,813                     | 41        | 0,0254              | 0,0127                 | 0,0406              | 0,0203                 | 0,0254              | 0,0178                 |
| 6                       | 0.620      | 0/–0.005        | 0/–0.0025              | 0.591               | 0.015                                  | 0.032                     | 0.15      | 0.0010              | 0.0005                 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |
|                         | 15,748     | 0/–0,127        | 0/–0,0635              | 15,011              | 0,381                                  | 0,813                     | 68        | 0,0254              | 0,0127                 | 0,0406              | 0,0203                 | 0,0254              | 0,0178                 |
| 8                       | 0.620      | 0/–0.005        | 0/–0.0025              | 0.768               | 0.015                                  | 0.044                     | 0.21      | 0.0010              | 0.0005                 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |
|                         | 15,748     | 0/–0,127        | 0/–0,0635              | 19,507              | 0,381                                  | 1,118                     | 95        | 0,0254              | 0,0127                 | 0,0406              | 0,0203                 | 0,0254              | 0,0178                 |
| 10                      | 0.620      | 0/–0.005        | 0/–0.0025              | 0.850               | 0.015                                  | 0.044                     | 0.28      | 0.0010              | 0.0005                 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |
|                         | 15,748     | 0/–0,127        | 0/–0,0635              | 21,590              | 0,381                                  | 1,118                     | 127       | 0,0254              | 0,0127                 | 0,0406              | 0,0203                 | 0,0254              | 0,0178                 |

**Designation system**

Examples: ZWMKP10SK2CP55RP01  
KP 3LP

ZW M KP 10 SK2 CP55 RP01

**Material and surface treatment**

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

**Tolerances**

**No code** Standard tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

**Basic designation**

**Bore code** (multiples of 1/16<sup>th</sup> inch)

**Variation**

|                      | Lubricant | Version  | Radial clearance<br>KP.. | MKP.. <sup>1)</sup> |
|----------------------|-----------|----------|--------------------------|---------------------|
| SK2                  | G354      | Sealed   | Standard                 | Reduced             |
| S281                 | G395      | Sealed   | Standard                 | Reduced             |
| S281-R               | G395      | Sealed   | Reduced                  | –                   |
| SK2-R                | G354      | Sealed   | Reduced                  | –                   |
| P <sup>1)</sup>      | G354      | Shielded | Standard                 | Reduced             |
| PG81 <sup>1)</sup>   | G395      | Shielded | Standard                 | Reduced             |
| PG81-R <sup>1)</sup> | G395      | Shielded | Reduced                  | –                   |
| P-R <sup>1)</sup>    | G354      | Shielded | Reduced                  | –                   |

**Passivation**

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

**Oversize**

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

1) SKF option

2) SKF option, available only for corrosion-resistant steel material without other surface treatment

**Tolerances cont., loads, clearance and torque**

| Nominal bore code | Tolerances       |                     | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup>       |       | Radial clearance |                | Maximum starting torque <sup>5)</sup> |        |
|-------------------|------------------|---------------------|-----------------------|----------------------|--------------------------------------------------|-------|------------------|----------------|---------------------------------------|--------|
|                   | Sea max Standard | SKF super precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring inner ring |       | Standard         | Reduced        | Shielded                              | Sealed |
| –                 | in/mm            |                     | lbf/kN                |                      | lbf/kN                                           |       | in/mm            |                | oz-in/mNm                             |        |
| 3L                | 0.0016           | 0.0010              | 1 560                 | 700                  | 1 520                                            | 1 260 | 0.0004/ 0.0010   | 0.0002/ 0.0005 | 0.67                                  | 1      |
|                   | 0,0406           | 0,0254              | 6,94                  | 3,11                 | 6,76                                             | 5,60  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 4,71                                  | 7,06   |
| 3                 | 0.0016           | 0.0010              | 1 880                 | 900                  | 1 700                                            | 1 450 | 0.0004/ 0.0010   | 0.0002/ 0.0005 | 0.67                                  | 1      |
|                   | 0,0406           | 0,0254              | 8,36                  | 4,00                 | 7,56                                             | 6,45  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 4,71                                  | 7,06   |
| 4                 | 0.0016           | 0.0010              | 2 680                 | 1 200                | 2 410                                            | 2 030 | 0.0004/ 0.0010   | 0.0002/ 0.0005 | 0.67                                  | 1      |
|                   | 0,0406           | 0,0254              | 11,92                 | 5,34                 | 10,72                                            | 9,03  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 4,71                                  | 7,06   |
| 5                 | 0.0016           | 0.0010              | 5 620                 | 2 500                | 4 900                                            | 3 970 | 0.0004/ 0.0010   | 0.0002/ 0.0005 | 0.67                                  | 1      |
|                   | 0,0406           | 0,0254              | 25,00                 | 11,12                | 21,8                                             | 17,66 | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 4,71                                  | 7,06   |
| 6                 | 0.0016           | 0.0010              | 7 910                 | 3 500                | 6 540                                            | 5 410 | 0.0004/ 0.0010   | 0.0002/ 0.0005 | 1.33                                  | 2      |
|                   | 0,0406           | 0,0254              | 35,18                 | 15,57                | 29,09                                            | 24,06 | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 9,41                                  | 14,12  |
| 8                 | 0.0016           | 0.0010              | 11 800                | 5 200                | 9 320                                            | 7 700 | 0.0004/ 0.0010   | 0.0002/ 0.0005 | 2                                     | 3      |
|                   | 0,0406           | 0,0254              | 52,49                 | 23,13                | 41,46                                            | 34,25 | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 14,12                                 | 21,18  |
| 10                | 0.0016           | 0.0010              | 14 100                | 6 200                | 11 000                                           | 9 060 | 0.0004/ 0.0010   | 0.0002/ 0.0005 | 2                                     | 4      |
|                   | 0,0406           | 0,0254              | 62,72                 | 27,58                | 48,93                                            | 40,3  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 14,12                                 | 28,25  |

3) For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

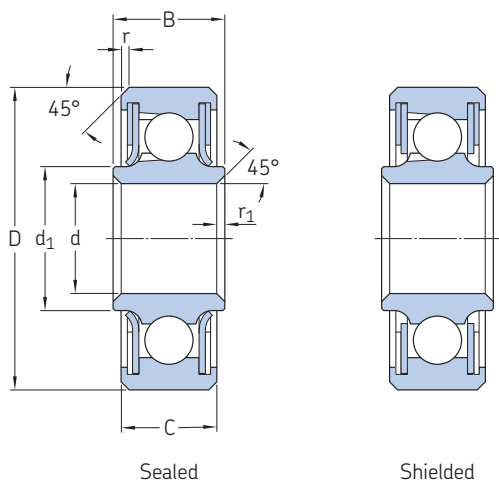
4) If G395 load rating is 20% lower

5) Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.15 Deep groove ball bearing single row (inch dimensions)

KP..A bore code 3 to 8

|                         |          |
|-------------------------|----------|
| Technical specification | AS 7949  |
| Product standard        | AS 27641 |



### Dimensions

| Nominal bore code | Dimensions       | $\Delta d_{mp}$        | $\Delta d_s$           | D                | $\Delta D_{mp}$        | $\Delta D_s$           | C              | $\Delta C_s$         |
|-------------------|------------------|------------------------|------------------------|------------------|------------------------|------------------------|----------------|----------------------|
|                   | d                | Standard               | SKF super precision    |                  | Standard               | SKF super precision    |                | Standard             |
| –                 | in/mm            |                        |                        |                  |                        |                        |                |                      |
| 3                 | 0.1900<br>4,826  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | 0.6250<br>15,875 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | 0.234<br>5,943 | 0/-0.005<br>0/-0,127 |
| 4                 | 0.2500<br>6,350  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | 0.7500<br>19,050 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | 0.219<br>5,562 | 0/-0.005<br>0/-0,127 |
| 5                 | 0.3125<br>7,938  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | 0.8125<br>20,638 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | 0.234<br>5,943 | 0/-0.005<br>0/-0,127 |
| 6                 | 0.3750<br>9,525  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | 0.8750<br>22,225 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | 0.250<br>6,350 | 0/-0.005<br>0/-0,127 |
| 8                 | 0.5000<br>12,700 | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | 1.1250<br>28,575 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | 0.313<br>7,950 | 0/-0.005<br>0/-0,127 |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions     | $\Delta B_s$         | $d_1$                  | $r_1$           | r                        | Mass                     | Tolerances          | Kea max             | Sia max             |
|-------------------|----------------|----------------------|------------------------|-----------------|--------------------------|--------------------------|---------------------|---------------------|---------------------|
|                   | B              | Standard             | SKF super precision    | $\approx$       | $+0.015/0$<br>$+0,381/0$ | $+0.015/0$<br>$+0,381/0$ | Kia max<br>Standard | SKF super precision | Standard            |
| –                 | in/mm          |                      |                        |                 |                          | lb/g                     | in/mm               |                     | SKF super precision |
| 3                 | 0.297<br>7,543 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.297<br>7,543  | 0.005<br>0,127           | 0.016<br>0,406           | 0.0010<br>0,0254    | 0.0005<br>0,0127    | 0.0010<br>0,0254    |
| 4                 | 0.281<br>7,137 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.380<br>9,652  | 0.005<br>0,127           | 0.016<br>0,406           | 0.0010<br>0,0254    | 0.0005<br>0,0127    | 0.0010<br>0,0254    |
| 5                 | 0.297<br>7,543 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.415<br>10,541 | 0.015<br>0,381           | 0.016<br>0,406           | 0.0010<br>0,0254    | 0.0005<br>0,0127    | 0.0010<br>0,0254    |
| 6                 | 0.313<br>7,950 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.495<br>12,573 | 0.015<br>0,381           | 0.016<br>0,406           | 0.0010<br>0,0254    | 0.0005<br>0,0127    | 0.0010<br>0,0254    |
| 8                 | 0.375<br>9,525 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.616<br>15,646 | 0.015<br>0,381           | 0.016<br>0,406           | 0.0010<br>0,0254    | 0.0005<br>0,0127    | 0.0010<br>0,0254    |

**Designation system**

Examples: ZWMKP10ASK2CP55RP01  
KP 8AP

ZW M KP 10 A SK2 CP55 RP01

**Material and surface treatment**

**No code** Cadmium plated bearing steel  
**W**<sup>1)</sup> Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW**<sup>1)</sup> Cadmium plated corrosion-resistant steel  
**SZW**<sup>1)</sup> Zinc-nickel plated corrosion-resistant steel

**Tolerances**

**No code** Standard tolerances  
**M**<sup>1)</sup> Reduced clearance and SKF super precision

**Basic designation**

**Bore code** (multiples of 1/16<sup>th</sup> inch)

**Variation**

|                      | Lubricant | Version  | Radial clearance |                     |
|----------------------|-----------|----------|------------------|---------------------|
|                      |           |          | KP..             | MKP.. <sup>1)</sup> |
| SK2                  | G354      | Sealed   | Standard         | Reduced             |
| S281                 | G395      | Sealed   | Standard         | Reduced             |
| S281-R               | G395      | Sealed   | Reduced          | —                   |
| SK2-R                | G354      | Sealed   | Reduced          | —                   |
| P <sup>1)</sup>      | G354      | Shielded | Standard         | Reduced             |
| PG81 <sup>1)</sup>   | G395      | Shielded | Standard         | Reduced             |
| PG81-R <sup>1)</sup> | G395      | Shielded | Reduced          | —                   |
| P-R <sup>1)</sup>    | G354      | Shielded | Reduced          | —                   |

**Passivation**

**No code** Not treated  
**CP55**<sup>2)</sup> Passivated corrosion-resistant steel

**Oversize**

**No code** Standard outer diameter size  
**RP01**<sup>1)</sup> 0.010 in/0,254 mm oversized outer diameter  
**RP02**<sup>1)</sup> 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

**Tolerances cont., loads, clearance and torque**

| Nominal bore code | Tolerances       |                     | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup>       |                | Radial clearance                 |                                  | Maximum starting torque <sup>5)</sup> |              |
|-------------------|------------------|---------------------|-----------------------|----------------------|--------------------------------------------------|----------------|----------------------------------|----------------------------------|---------------------------------------|--------------|
|                   | Sea max Standard | SKF super precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring inner ring |                | Standard                         | Reduced                          | Shielded                              | Sealed       |
| —                 | in/mm            |                     | lbf/kN                |                      | lbf/kN                                           |                | in/mm                            |                                  | oz-in/mNm                             |              |
| 3                 | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 1 560<br>6,94         | 700<br>3,11          | 1 500<br>6,67                                    | 1 250<br>5,56  | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 0.67<br>4,73                          | 1<br>7,06    |
| 4                 | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 1 880<br>8,36         | 900<br>4,00          | 1 690<br>7,52                                    | 1 450<br>6,45  | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 1<br>7,06                             | 1.5<br>10.59 |
| 5                 | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 2 190<br>9,74         | 1 000<br>4,45        | 1 820<br>8,10                                    | 1 600<br>7,12  | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 1<br>7,06                             | 1.5<br>10.59 |
| 6                 | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 2 500<br>11,12        | 1 100<br>4,89        | 1 920<br>8,54                                    | 1 710<br>7,61  | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 1.33<br>9.41                          | 2<br>14.12   |
| 8                 | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 3 910<br>17,39        | 1 700<br>7,56        | 2 870<br>12,77                                   | 2 550<br>11,34 | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 1.67<br>11.77                         | 2.5<br>17.65 |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

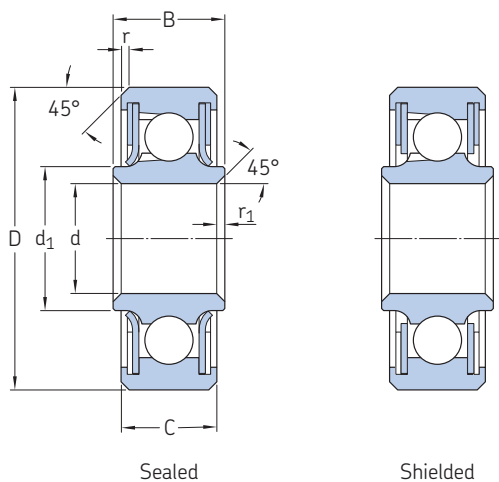
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.15 Deep groove ball bearing single row (inch dimensions)

KP..A bore code **10** to **20**

|                         |          |
|-------------------------|----------|
| Technical specification | AS 7949  |
| Product standard        | AS 27641 |



### Dimensions

| Nominal bore code | Dimensions       | $\Delta d_{mp}$        | $\Delta d_s$           | D                | $\Delta D_{mp}$        | $\Delta D_s$           | C               | $\Delta C_s$         |
|-------------------|------------------|------------------------|------------------------|------------------|------------------------|------------------------|-----------------|----------------------|
|                   | d                | Standard               | SKF super precision    |                  | Standard               | SKF super precision    |                 | Standard             |
| –                 | in/mm            |                        |                        |                  |                        |                        |                 |                      |
| <b>10</b>         | 0,6250<br>15,875 | 0/–0,0005<br>0/–0,0127 | 0/–0,0003<br>0/–0,0076 | 1,3750<br>34,925 | 0/–0,0005<br>0/–0,0127 | 0/–0,0004<br>0/–0,0101 | 0,344<br>8,737  | 0/–0,005<br>0/–0,127 |
| <b>12</b>         | 0,7500<br>19,050 | 0/–0,0005<br>0/–0,0127 | 0/–0,0003<br>0/–0,0076 | 1,6250<br>41,275 | 0/–0,0005<br>0/–0,0127 | 0/–0,0004<br>0/–0,0101 | 0,375<br>9,525  | 0/–0,005<br>0/–0,127 |
| <b>16</b>         | 1,0000<br>25,400 | 0/–0,0005<br>0/–0,0127 | 0/–0,0003<br>0/–0,0076 | 2,0000<br>50,800 | 0/–0,0005<br>0/–0,0127 | 0/–0,0004<br>0/–0,0101 | 0,438<br>11,125 | 0/–0,005<br>0/–0,127 |
| <b>20</b>         | 1,2500<br>31,750 | 0/–0,0005<br>0/–0,0127 | 0/–0,0003<br>0/–0,0076 | 2,2500<br>57,150 | 0/–0,0005<br>0/–0,0127 | 0/–0,0004<br>0/–0,0101 | 0,438<br>11,125 | 0/–0,005<br>0/–0,127 |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions      | $\Delta B_s$         | $d_1$                  | $r_1$           | r                    | Mass          | Tolerances          | Kea max          | Sia max          |
|-------------------|-----------------|----------------------|------------------------|-----------------|----------------------|---------------|---------------------|------------------|------------------|
|                   | B               | Standard             | SKF super precision    | $\approx$       | +0,015/0<br>+0,381/0 | $\approx$     | Kia max<br>Standard | Standard         | Standard         |
| –                 | in/mm           |                      |                        |                 |                      | lb/g          | in/mm               |                  |                  |
| <b>10</b>         | 0,406<br>10,312 | 0/–0,005<br>0/–0,127 | 0/–0,0025<br>0/–0,0635 | 0,768<br>19,507 | 0,015<br>0,381       | 0,032<br>8,13 | 0,0010<br>0,0254    | 0,0016<br>0,0406 | 0,0010<br>0,0254 |
| <b>12</b>         | 0,437<br>11,099 | 0/–0,005<br>0/–0,127 | 0/–0,0025<br>0/–0,0635 | 0,919<br>23,342 | 0,015<br>0,381       | 0,032<br>8,13 | 0,0010<br>0,0254    | 0,0016<br>0,0406 | 0,0010<br>0,0254 |
| <b>16</b>         | 0,500<br>12,700 | 0/–0,005<br>0/–0,127 | 0/–0,0025<br>0/–0,0635 | 1,241<br>31,521 | 0,015<br>0,381       | 0,032<br>8,13 | 0,0010<br>0,0254    | 0,0016<br>0,0406 | 0,0010<br>0,0254 |
| <b>20</b>         | 0,500<br>12,700 | 0/–0,005<br>0/–0,127 | 0/–0,0025<br>0/–0,0635 | 1,478<br>37,541 | 0,015<br>0,381       | 0,032<br>8,13 | 0,0010<br>0,0254    | 0,0016<br>0,0406 | 0,0010<br>0,0254 |



## Designation system

Examples: ZWMKP10ASK2CP55RP01  
 KP 8AP

ZW M KP 10 A SK2 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances

**No code** Standard tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                      | Lubricant | Version  | Radial clearance<br>KP.. | MKP.. <sup>1)</sup> |
|----------------------|-----------|----------|--------------------------|---------------------|
| SK2                  | G354      | Sealed   | Standard                 | Reduced             |
| S281                 | G395      | Sealed   | Standard                 | Reduced             |
| S281-R               | G395      | Sealed   | Reduced                  | –                   |
| SK2-R                | G354      | Sealed   | Reduced                  | –                   |
| P <sup>1)</sup>      | G354      | Shielded | Standard                 | Reduced             |
| PG81 <sup>1)</sup>   | G395      | Shielded | Standard                 | Reduced             |
| PG81-R <sup>1)</sup> | G395      | Shielded | Reduced                  | –                   |
| P-R <sup>1)</sup>    | G354      | Shielded | Reduced                  | –                   |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances       |                     | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup> |                                       | Radial clearance                 |                                  | Maximum starting torque <sup>5)</sup> |            |
|-------------------|------------------|---------------------|-----------------------|----------------------|--------------------------------------------|---------------------------------------|----------------------------------|----------------------------------|---------------------------------------|------------|
|                   | Sea max          | SKF super precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring      | Load fixed with respect to inner ring | Standard                         | Reduced                          | Shielded                              | Sealed     |
| –                 | in/mm            |                     | lbf/kN                |                      | lbf/kN                                     |                                       | in/mm                            |                                  | oz-in/mNm                             |            |
| <b>10</b>         | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 6 700<br>29,80        | 3 000<br>13,35       | 4 980<br>22,15                             | 4 360<br>19,39                        | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 2<br>14.12                            | 3<br>21,18 |
| <b>12</b>         | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 8 790<br>39,10        | 3 900<br>17,35       | 5 980<br>26,60                             | 5 320<br>23,66                        | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 2<br>14.12                            | 3<br>21,18 |
| <b>16</b>         | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 11 900<br>52,93       | 5 200<br>23,13       | 7 070<br>31,45                             | 6 400<br>28,47                        | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 2.67<br>18.83                         | 4<br>28.25 |
| <b>20</b>         | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 13 800<br>61,39       | 6 100<br>27,13       | 7 400<br>32,92                             | 6 810<br>30,29                        | 0.0004/ 0.0010<br>0,0101/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 3.33<br>23.53                         | 5<br>35.31 |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

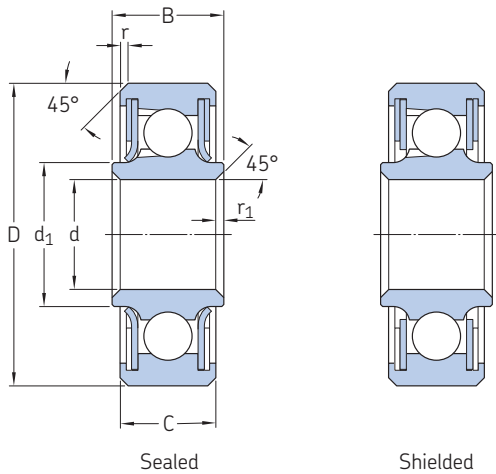
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.16 Deep groove ball bearing single row (inch dimensions)

KP..B bore code **16** to **37**

Technical specification AS 7949  
Product standard AS 27642



### Dimensions

| Nominal bore code | Dimensions       |                        |                                    |                                    |                                    |                  |                        |                        |                                    |  |
|-------------------|------------------|------------------------|------------------------------------|------------------------------------|------------------------------------|------------------|------------------------|------------------------|------------------------------------|--|
|                   | d                | Δdmp                   | Precision                          | Δds                                | Precision                          | D                | ΔDmp                   | Precision              | ΔDs                                |  |
|                   | Standard         |                        |                                    | Standard                           |                                    |                  | Standard               |                        |                                    |  |
| –                 | in/mm            |                        |                                    |                                    |                                    |                  |                        |                        |                                    |  |
| <b>16</b>         | 1.0000<br>25,400 | 0/–0.0005<br>0/–0,0127 | 0/–0.0005<br>0/–0,0127             | +0.0002/–0.0007<br>+0,0051/–0,0178 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 1.7500<br>44,450 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| <b>21</b>         | 1.3130<br>33,350 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 2.0625<br>52,387 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| <b>23</b>         | 1.4380<br>36,525 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 2.1875<br>55,562 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| <b>25</b>         | 1.5630<br>39,700 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 2.3125<br>58,737 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| <b>29</b>         | 1.8130<br>46,050 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 2.5625<br>65,087 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| <b>33</b>         | 2.0630<br>52,400 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 2.8125<br>71,437 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| <b>37</b>         | 2.3130<br>58,750 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 3.0625<br>77,787 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions     |                      |                      |                 |                      |                        |                 |                      |                      | Mass        | Tolerances       |                  |                  |                  |
|-------------------|----------------|----------------------|----------------------|-----------------|----------------------|------------------------|-----------------|----------------------|----------------------|-------------|------------------|------------------|------------------|------------------|
|                   | C              | ΔCs                  | Precision            | B               | ΔBs                  | Precision              | d <sub>1</sub>  | r <sub>1</sub>       | r                    | ≈           | Kia max          | Precision        | Kea max          | Precision        |
|                   | Standard       |                      |                      |                 | Standard             |                        | ≈               | +0.015/0<br>+0,381/0 | +0.015/0<br>+0,381/0 |             | Standard         |                  | Standard         |                  |
| –                 | in/mm          |                      |                      |                 |                      |                        |                 |                      |                      | lb/g        | in/mm            |                  |                  |                  |
| <b>16</b>         | 0.375<br>9,525 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.141<br>28,981 | 0.0240<br>0,610      | 0.0240<br>0,610      | 0.14<br>64  | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>21</b>         | 0.375<br>9,525 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.454<br>36,931 | 0.0240<br>0,610      | 0.0240<br>0,610      | 0.16<br>73  | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>23</b>         | 0.375<br>9,525 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.574<br>39,979 | 0.0240<br>0,610      | 0.0240<br>0,610      | 0.17<br>77  | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>25</b>         | 0.375<br>9,525 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.693<br>43,002 | 0.0240<br>0,838      | 0.0240<br>0,838      | 0.19<br>86  | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>29</b>         | 0.375<br>9,525 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.931<br>49,047 | 0.0240<br>0,610      | 0.0240<br>0,610      | 0.21<br>95  | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>33</b>         | 0.375<br>9,525 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 2.231<br>56,667 | 0.0240<br>0,610      | 0.0240<br>0,610      | 0.23<br>104 | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>37</b>         | 0.375<br>9,525 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 2.468<br>62,687 | 0.0240<br>0,610      | 0.0240<br>0,610      | 0.26<br>118 | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |

**Designation system**

Examples: ZWMKP16BSK2CP55RP01  
KP37BP

ZW M KP 16 B SK2 CP55 RP01

**Material and surface treatment**

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

**Tolerances**

**No code** Standard tolerances  
**M** Reduced clearance and precision

**Basic designation**

**Bore code** (multiples of 1/16<sup>th</sup> inch)

**Variation**

|                      | Lubricant | Version  | Radial clearance |         |
|----------------------|-----------|----------|------------------|---------|
|                      |           |          | KP..             | MKP..   |
| SK2                  | G354      | Sealed   | Standard         | Reduced |
| S281                 | G395      | Sealed   | Standard         | Reduced |
| S281-R <sup>1)</sup> | G395      | Sealed   | Reduced          | —       |
| SK2-R <sup>1)</sup>  | G354      | Sealed   | Reduced          | —       |
| P <sup>1)</sup>      | G354      | Shielded | Standard         | Reduced |
| PG81 <sup>1)</sup>   | G395      | Shielded | Standard         | Reduced |
| PG81-R <sup>1)</sup> | G395      | Shielded | Reduced          | —       |
| P-R <sup>1)</sup>    | G354      | Shielded | Reduced          | —       |

**Passivation**

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

**Oversize**

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

1) SKF option

2) SKF option, available only for corrosion-resistant steel material without other surface treatment

**Tolerances cont., loads, clearance and torque**

| Nominal bore code | Tolerances       |           |                  |           | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup> |                                       | Radial clearance |               | Maximum starting torque <sup>5)</sup> |        |
|-------------------|------------------|-----------|------------------|-----------|-----------------------|----------------------|--------------------------------------------|---------------------------------------|------------------|---------------|---------------------------------------|--------|
|                   | Sia max Standard | Precision | Sea max Standard | Precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring      | Load fixed with respect to inner ring | Standard         | Reduced       | Shielded                              | Sealed |
| —                 | in/mm            |           |                  |           | lbf/kN                |                      | lbf/kN                                     |                                       | in/mm            |               | oz-in/mNm                             |        |
| 16                | 0.0010           | 0.0008    | 0.0016           | 0.0010    | 8 090                 | 3 600                | 4 260                                      | 3 960                                 | 0.0003/0.0010    | 0.0001/0.0005 | 3.33                                  | 5      |
|                   | 0,0254           | 0,0203    | 0,0406           | 0,0254    | 35,99                 | 16,01                | 18,95                                      | 17,61                                 | 0,0076/0,0254    | 0,0025/0,0127 | 23,53                                 | 35,3   |
| 21                | 0.0010           | 0.0008    | 0.0016           | 0.0010    | 9 840                 | 4 400                | 4 590                                      | 4 290                                 | 0.0003/0.0010    | 0.0001/0.0005 | 4.67                                  | 7      |
|                   | 0,0254           | 0,0203    | 0,0406           | 0,0254    | 43,77                 | 19,57                | 20,42                                      | 19,08                                 | 0,0076/0,0254    | 0,0025/0,0127 | 32,95                                 | 49,42  |
| 23                | 0.0010           | 0.0008    | 0.0016           | 0.0010    | 10 500                | 4 700                | 4 650                                      | 4 360                                 | 0.0003/0.0010    | 0.0001/0.0005 | 5.33                                  | 9      |
|                   | 0,0254           | 0,0203    | 0,0406           | 0,0254    | 46,71                 | 20,91                | 20,68                                      | 19,39                                 | 0,0076/0,0254    | 0,0025/0,0127 | 37,65                                 | 63,54  |
| 25                | 0.0010           | 0.0008    | 0.0016           | 0.0010    | 11 300                | 5 000                | 4 680                                      | 4 420                                 | 0.0003/0.0010    | 0.0001/0.0005 | 6                                     | 9      |
|                   | 0,0254           | 0,0203    | 0,0406           | 0,0254    | 50,27                 | 22,24                | 20,82                                      | 19,66                                 | 0,0076/0,0254    | 0,0025/0,0127 | 42,36                                 | 63,54  |
| 29                | 0.0010           | 0.0008    | 0.0016           | 0.0010    | 12 700                | 5 600                | 4 760                                      | 4 530                                 | 0.0003/0.0010    | 0.0001/0.0005 | 8                                     | 14     |
|                   | 0,0254           | 0,0203    | 0,0406           | 0,0254    | 56,49                 | 24,91                | 21,17                                      | 20,15                                 | 0,0076/0,0254    | 0,0025/0,0127 | 56,48                                 | 98,84  |
| 33                | 0.0010           | 0.0008    | 0.0016           | 0.0010    | 14 400                | 6 400                | 4 820                                      | 4 630                                 | 0.0003/0.0010    | 0.0001/0.0005 | 9.33                                  | 14     |
|                   | 0,0254           | 0,0203    | 0,0406           | 0,0254    | 64,05                 | 28,47                | 21,44                                      | 20,60                                 | 0,0076/0,0254    | 0,0025/0,0127 | 65,89                                 | 98,84  |
| 37                | 0.0010           | 0.0008    | 0.0016           | 0.0010    | 15 800                | 7 000                | 4 880                                      | 4 690                                 | 0.0003/0.0010    | 0.0001/0.0005 | 11.33                                 | 20     |
|                   | 0,0254           | 0,0203    | 0,0406           | 0,0254    | 70,28                 | 31,14                | 21,71                                      | 20,86                                 | 0,0076/0,0254    | 0,0025/0,0127 | 80,01                                 | 141,23 |

3) For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

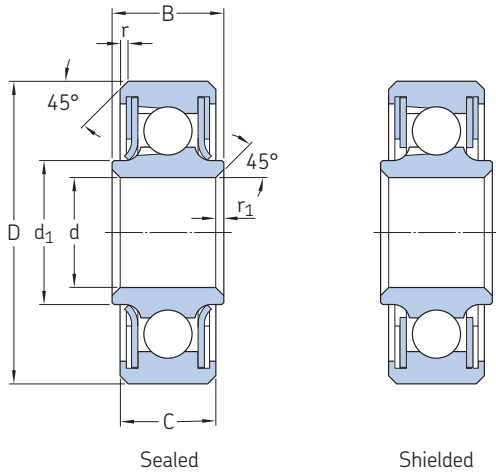
4) If G395 load rating is 20% lower

5) Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.16 Deep groove ball bearing single row (inch dimensions)

KP..B bore code 47 to 68

|                         |          |
|-------------------------|----------|
| Technical specification | AS 7949  |
| Product standard        | AS 27642 |



### Dimensions

| Nominal bore code | Dimensions        |                        |                                    |                                    |                                    |                   |                        |                        |                                    |  |
|-------------------|-------------------|------------------------|------------------------------------|------------------------------------|------------------------------------|-------------------|------------------------|------------------------|------------------------------------|--|
|                   | d                 | $\Delta d_{mp}$        | Precision                          | $\Delta d_s$                       | Precision                          | D                 | $\Delta D_{mp}$        | Precision              | $\Delta D_s$                       |  |
|                   | Standard          |                        |                                    | Standard                           |                                    |                   | Standard               |                        |                                    |  |
| –                 | in/mm             |                        |                                    |                                    |                                    |                   |                        |                        |                                    |  |
| 47                | 2.9380<br>74,625  | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 3.8750<br>98,425  | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| 49                | 3.0630<br>77,800  | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | +0.0003/–0.0008<br>+0,0076/–0,0203 | 4.0000<br>101,600 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| 52                | 3.2500<br>82,550  | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254             | +0.0005/–0.0015<br>+0,0127/–0,0381 | +0.0003/–0.0013<br>+0,0076/–0,0330 | 4.1875<br>106,363 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| 56                | 3.5000<br>88,900  | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254             | +0.0005/–0.0015<br>+0,0127/–0,0381 | +0.0003/–0.0013<br>+0,0076/–0,0330 | 4.4375<br>112,713 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| 60                | 3.7500<br>95,250  | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254             | +0.0005/–0.0015<br>+0,0127/–0,0381 | +0.0003/–0.0013<br>+0,0076/–0,0330 | 4.6875<br>119,063 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| 64                | 4.0000<br>101,600 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254             | +0.0005/–0.0015<br>+0,0127/–0,0381 | +0.0003/–0.0013<br>+0,0076/–0,0330 | 4.9375<br>125,413 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |
| 68                | 4.2500<br>107,950 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254             | +0.0005/–0.0015<br>+0,0127/–0,0381 | +0.0003/–0.0013<br>+0,0076/–0,0330 | 5.3125<br>134,938 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 |  |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions      |                      |                      |                 |                      |                        |                  |                |                | Mass        | Tolerances       |                  |                  |                  |
|-------------------|-----------------|----------------------|----------------------|-----------------|----------------------|------------------------|------------------|----------------|----------------|-------------|------------------|------------------|------------------|------------------|
|                   | C               | $\Delta C_s$         | Precision            | B               | $\Delta B_s$         | Precision              | d <sub>1</sub>   | r <sub>1</sub> | r              | ≈           | Kia max          | Kea max          |                  |                  |
|                   | Standard        |                      |                      |                 | Standard             |                        |                  |                |                |             | Standard         | Standard         |                  |                  |
| –                 | in/mm           |                      |                      |                 |                      |                        |                  |                |                | lb/g        | in/mm            |                  |                  |                  |
| 47                | 0.469<br>11,912 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 3.093<br>78,562  | 0.039<br>0,991 | 0.039<br>0,991 | 0.49<br>222 | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| 49                | 0.469<br>11,913 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 3.222<br>81,838  | 0.039<br>0,991 | 0.039<br>0,991 | 0.53<br>240 | 0.0010<br>0,0254 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| 52                | 0.469<br>11,913 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127   | 3.479<br>88,367  | 0.039<br>0,991 | 0.039<br>0,991 | 0.55<br>249 | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0016<br>0,0406 | 0.0016<br>0,0406 |
| 56                | 0.469<br>11,913 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127   | 3.775<br>95,885  | 0.039<br>0,991 | 0.039<br>0,991 | 0.58<br>263 | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0016<br>0,0406 | 0.0016<br>0,0406 |
| 60                | 0.469<br>11,913 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127   | 4.014<br>101,956 | 0.039<br>0,991 | 0.039<br>0,991 | 0.61<br>277 | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0016<br>0,0406 | 0.0016<br>0,0406 |
| 64                | 0.469<br>11,913 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127   | 4.253<br>108,026 | 0.039<br>0,991 | 0.039<br>0,991 | 0.64<br>290 | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0016<br>0,0406 | 0.0016<br>0,0406 |
| 68                | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.593<br>15,062 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127   | 4.517<br>114,732 | 0.039<br>0,991 | 0.039<br>0,991 | 0.73<br>331 | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0016<br>0,0406 | 0.0016<br>0,0406 |



## Designation system

Examples: ZWMKP16BSK2CP55RP01  
KP37BP

ZW M KP 16 B SK2 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances

**No code** Standard tolerances  
**M** Reduced clearance and precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                            | Lubricant | Version  | Radial clearance<br>KP.. | MKP..   |
|----------------------------|-----------|----------|--------------------------|---------|
| <b>SK2</b>                 | G354      | Sealed   | Standard                 | Reduced |
| <b>S281</b>                | G395      | Sealed   | Standard                 | Reduced |
| <b>S281-R<sup>1)</sup></b> | G395      | Sealed   | Reduced                  | –       |
| <b>SK2-R<sup>1)</sup></b>  | G354      | Sealed   | Reduced                  | –       |
| <b>P<sup>1)</sup></b>      | G354      | Shielded | Standard                 | Reduced |
| <b>PG81<sup>1)</sup></b>   | G395      | Shielded | Standard                 | Reduced |
| <b>PG81-R<sup>1)</sup></b> | G395      | Shielded | Reduced                  | –       |
| <b>P-R<sup>1)</sup></b>    | G354      | Shielded | Reduced                  | –       |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances          |                  |                     |                  | Static limit loads       |                         | Radial dynamic load rating <sup>3)4)</sup> |                                                     | Radial clearance               |                                | Maximum starting torque <sup>5)</sup>             |              |
|-------------------|---------------------|------------------|---------------------|------------------|--------------------------|-------------------------|--------------------------------------------|-----------------------------------------------------|--------------------------------|--------------------------------|---------------------------------------------------|--------------|
|                   | Sia max<br>Standard | Precision        | Sea max<br>Standard | Precision        | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | rating <sup>3)4)</sup>                     | Load fixed with respect to<br>outer ring inner ring | Standard                       | Reduced                        | Shielded                                          | Sealed       |
| –                 | in/mm               |                  |                     |                  | lbf/kN                   |                         |                                            |                                                     | in/mm                          |                                | oz-in/mNm                                         |              |
| <b>47</b>         | 0.0010<br>0,0254    | 0.0008<br>0,0203 | 0.0016<br>0,0406    | 0.0010<br>0,0254 | 24 700<br>109,87         | 10 900<br>48,49         | 6 600<br>29,36                             | 6 390<br>28,42                                      | 0.0003/0.0010<br>0,0076/0,0254 | 0.0001/0.0005<br>0,0025/0,0127 | 16<br>112,96                                      | 30<br>211,85 |
| <b>49</b>         | 0.0010<br>0,0254    | 0.0008<br>0,0203 | 0.0016<br>0,0406    | 0.0010<br>0,0254 | 27 500<br>122,33         | 12 100<br>53,82         | 8 150<br>36,25                             | 7 840<br>34,87                                      | 0.0003/0.0010<br>0,0076/0,0254 | 0.0001/0.0005<br>0,0025/0,0127 | 16,67<br>117,67                                   | 32<br>225,97 |
| <b>52</b>         | 0.0010<br>0,0254    | 0.0010<br>0,0254 | 0.0016<br>0,0406    | 0.0016<br>0,0406 | 28 700<br>127,66         | 12 600<br>56,05         | 8 210<br>36,52                             | 7 880<br>35,05                                      | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                                   |              |
| <b>56</b>         | 0.0010<br>0,0254    | 0.0010<br>0,0254 | 0.0016<br>0,0406    | 0.0016<br>0,0406 | 31 200<br>138,78         | 13 700<br>60,94         | 8 240<br>36,65                             | 7 970<br>35,45                                      | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 | Value shall<br>be specified in<br>purchase orders |              |
| <b>60</b>         | 0.0010<br>0,0254    | 0.0010<br>0,0254 | 0.0016<br>0,0406    | 0.0016<br>0,0406 | 33 100<br>147,24         | 14 600<br>64,94         | 8 290<br>36,88                             | 8 010<br>35,63                                      | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                                   |              |
| <b>64</b>         | 0.0010<br>0,0254    | 0.0010<br>0,0254 | 0.0016<br>0,0406    | 0.0016<br>0,0406 | 35 000<br>155,69         | 15 400<br>68,50         | 8 350<br>37,14                             | 8 100<br>36,03                                      | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                                   |              |
| <b>68</b>         | 0.0010<br>0,0254    | 0.0010<br>0,0254 | 0.0016<br>0,0406    | 0.0016<br>0,0406 | 41 900<br>186,38         | 18 400<br>81,85         | 10 280<br>45,73                            | 9 900<br>44,04                                      | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                                   |              |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

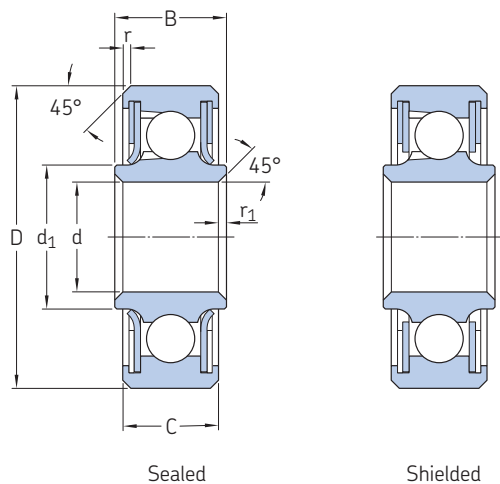
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.16 Deep groove ball bearing single row (inch dimensions)

KP.. B bore code 72 to 96

Technical specification AS 7949  
Product standard AS 27642



### Dimensions

| Nominal bore code | Dimensions        |                        |                        |                                    |                                    |                   |                        |                        |                                    |  |
|-------------------|-------------------|------------------------|------------------------|------------------------------------|------------------------------------|-------------------|------------------------|------------------------|------------------------------------|--|
| d                 | Δdmp              | Precision              | Δds                    | Precision                          | D                                  | ΔDmp              | Precision              | ΔDs                    |                                    |  |
| Standard          | Standard          |                        | Standard               |                                    |                                    | Standard          |                        |                        |                                    |  |
| in/mm             |                   |                        |                        |                                    |                                    |                   |                        |                        |                                    |  |
| <b>72</b>         | 4.5000<br>114,300 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0005/-0.0015<br>+0,0127/-0,0381 | +0.0003/-0.0013<br>+0,0076/-0,0330 | 5.5625<br>141,288 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 |  |
| <b>76</b>         | 4.7500<br>120,650 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0005/-0.0015<br>+0,0127/-0,0381 | +0.0003/-0.0013<br>+0,0076/-0,0330 | 5.8125<br>147,638 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 |  |
| <b>80</b>         | 5.0000<br>127,000 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0005/-0.0015<br>+0,0127/-0,0381 | +0.0003/-0.0013<br>+0,0076/-0,0330 | 6.0625<br>153,988 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 |  |
| <b>84</b>         | 5.2500<br>133,350 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0005/-0.0015<br>+0,0127/-0,0381 | +0.0003/-0.0013<br>+0,0076/-0,0330 | 6.3125<br>160,338 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 |  |
| <b>88</b>         | 5.5000<br>139,700 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0005/-0.0015<br>+0,0127/-0,0381 | +0.0003/-0.0013<br>+0,0076/-0,0330 | 6.5625<br>166,687 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 |  |
| <b>92</b>         | 5.7500<br>146,050 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0005/-0.0015<br>+0,0127/-0,0381 | +0.0003/-0.0013<br>+0,0076/-0,0330 | 6.8125<br>173,037 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 |  |
| <b>96</b>         | 6.0000<br>152,400 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0005/-0.0015<br>+0,0127/-0,0381 | +0.0003/-0.0013<br>+0,0076/-0,0330 | 7.0625<br>179,387 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 |  |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions      |                      |                      | B               | ΔBs                  |                      | d1               | r1                   | r                    | Mass        | Tolerances       |                  |                  |                  |
|-------------------|-----------------|----------------------|----------------------|-----------------|----------------------|----------------------|------------------|----------------------|----------------------|-------------|------------------|------------------|------------------|------------------|
| C                 | ΔCs             | Precision            |                      |                 | Standard             | Precision            | ≈                | +0.015/0<br>+0,381/0 | +0.015/0<br>+0,381/0 | ≈           | Kia max          | Precision        | Kea max          | Precision        |
| Standard          | Standard        |                      |                      |                 |                      |                      |                  |                      |                      |             | Standard         |                  | Standard         |                  |
| in/mm             |                 |                      |                      |                 |                      |                      |                  |                      |                      | lb/g        | in/mm            |                  |                  |                  |
| <b>72</b>         | 0.531<br>13,487 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 0.593<br>15,062 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 4.774<br>121,260 | 0.039<br>0,991       | 0.039<br>0,991       | 0.76<br>345 | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0016<br>0,0406 | 0.0016<br>0,0406 |
| <b>76</b>         | 0.531<br>13,487 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 0.593<br>15,062 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 5.046<br>128,168 | 0.039<br>0,991       | 0.039<br>0,991       | 1.00<br>454 | 0.0014<br>0,0356 | 0.0014<br>0,0356 | 0.0018<br>0,0457 | 0.0018<br>0,0457 |
| <b>80</b>         | 0.531<br>13,487 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 0.593<br>15,062 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 5.246<br>133,248 | 0.039<br>0,991       | 0.039<br>0,991       | 1.04<br>472 | 0.0014<br>0,0356 | 0.0014<br>0,0356 | 0.0018<br>0,0457 | 0.0018<br>0,0457 |
| <b>84</b>         | 0.531<br>13,487 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 0.593<br>15,062 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 5.506<br>139,852 | 0.039<br>0,991       | 0.039<br>0,991       | 1.09<br>494 | 0.0014<br>0,0356 | 0.0014<br>0,0356 | 0.0018<br>0,0457 | 0.0018<br>0,0457 |
| <b>88</b>         | 0.531<br>13,487 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 0.593<br>15,062 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 5.770<br>146,558 | 0.039<br>0,991       | 0.039<br>0,991       | 1.14<br>517 | 0.0014<br>0,0356 | 0.0014<br>0,0356 | 0.0018<br>0,0457 | 0.0018<br>0,0457 |
| <b>92</b>         | 0.531<br>13,487 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 0.593<br>15,062 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 6.033<br>153,238 | 0.039<br>0,991       | 0.039<br>0,991       | 1.18<br>535 | 0.0014<br>0,0356 | 0.0014<br>0,0356 | 0.0018<br>0,0457 | 0.0018<br>0,0457 |
| <b>96</b>         | 0.531<br>13,487 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 0.593<br>15,062 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 | 6.303<br>160,096 | 0.039<br>0,991       | 0.039<br>0,991       | 1.23<br>558 | 0.0014<br>0,0356 | 0.0014<br>0,0356 | 0.0020<br>0,0508 | 0.0020<br>0,0508 |



## Designation system

Examples: ZWMKP16BSK2CP55RP01  
KP37BP

ZW M KP 16 B SK2 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances

**No code** Standard tolerances  
**M** Reduced clearance and precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                            | Lubricant | Version  | Radial clearance<br>KP.. | MKP..   |
|----------------------------|-----------|----------|--------------------------|---------|
| <b>SK2</b>                 | G354      | Sealed   | Standard                 | Reduced |
| <b>S281</b>                | G395      | Sealed   | Standard                 | Reduced |
| <b>S281-R<sup>1)</sup></b> | G395      | Sealed   | Reduced                  | –       |
| <b>SK2-R<sup>1)</sup></b>  | G354      | Sealed   | Reduced                  | –       |
| <b>P<sup>1)</sup></b>      | G354      | Shielded | Standard                 | Reduced |
| <b>PG81<sup>1)</sup></b>   | G395      | Shielded | Standard                 | Reduced |
| <b>PG81-R<sup>1)</sup></b> | G395      | Shielded | Reduced                  | –       |
| <b>P-R<sup>1)</sup></b>    | G354      | Shielded | Reduced                  | –       |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances       |                  |                  |                  | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup> |                                       | Radial clearance               |                                | Maximum starting torque <sup>5)</sup> |        |
|-------------------|------------------|------------------|------------------|------------------|-----------------------|----------------------|--------------------------------------------|---------------------------------------|--------------------------------|--------------------------------|---------------------------------------|--------|
|                   | Sia max          | Precision        | Sea max          | Precision        | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring      | Load fixed with respect to inner ring | Standard                       | Reduced                        | Shielded                              | Sealed |
| –                 | in/mm            |                  |                  |                  | lbf/kN                |                      |                                            |                                       | in/mm                          |                                | oz-in/mNm                             |        |
| <b>72</b>         | 0.0010<br>0,0254 | 0.0010<br>0,0254 | 0.0016<br>0,0406 | 0.0016<br>0,0406 | 44 300<br>197,06      | 19 500<br>86,74      | 10 330<br>45,95                            | 10 000<br>44,48                       | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                       |        |
| <b>76</b>         | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0018<br>0,0457 | 0.0018<br>0,0457 | 46 700<br>207,73      | 20 500<br>91,19      | 10 350<br>46,04                            | 10 050<br>44,70                       | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                       |        |
| <b>80</b>         | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0018<br>0,0457 | 0.0018<br>0,0457 | 48 200<br>214,40      | 21 200<br>94,30      | 10 360<br>46,08                            | 10 090<br>44,88                       | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                       |        |
| <b>84</b>         | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0018<br>0,0457 | 0.0018<br>0,0457 | 50 600<br>225,08      | 22 300<br>99,20      | 10 420<br>46,35                            | 10 120<br>45,02                       | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                       |        |
| <b>88</b>         | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0018<br>0,0457 | 0.0018<br>0,0457 | 53 000<br>235,76      | 23 300<br>103,64     | 10 480<br>46,62                            | 10 200<br>45,37                       | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                       |        |
| <b>92</b>         | 0.0012<br>0,0305 | 0.0012<br>0,0305 | 0.0018<br>0,0457 | 0.0018<br>0,0457 | 55 400<br>246,43      | 24 400<br>108,54     | 10 550<br>46,93                            | 10 240<br>45,55                       | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                       |        |
| <b>96</b>         | 0.0016<br>0,0406 | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0020<br>0,0508 | 57 700<br>256,66      | 25 400<br>112,98     | 10 520<br>46,80                            | 10 210<br>45,42                       | 0.0003/0.0015<br>0,0076/0,0381 | 0.0001/0.0005<br>0,0025/0,0127 |                                       |        |

Value shall be specified in purchase orders

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.17 Deep groove ball bearing single row (inch dimensions)

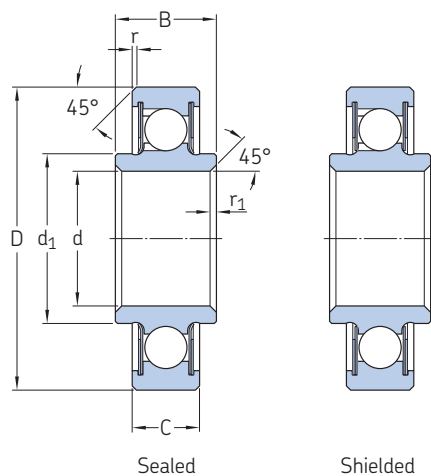
KP..SP., KP..A..SP., KP..L..SP..

Technical specification

–

Product standard

–



### Dimensions, loads and clearance

| Nominal bore code | Dimensions                            |                                       |  | C                | B                | d <sub>1</sub><br>≈ | r <sub>1</sub><br>Min | r<br>Min       | Mass<br>≈   | Static limit loads       |                         | Radial clearance               |
|-------------------|---------------------------------------|---------------------------------------|--|------------------|------------------|---------------------|-----------------------|----------------|-------------|--------------------------|-------------------------|--------------------------------|
|                   | d<br>+0.0002/–0.0003<br>+0,005/–0,008 | D<br>–0.0003/–0.0008<br>–0,008/–0,020 |  |                  |                  |                     |                       |                |             | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> |                                |
| –                 | in/mm                                 |                                       |  |                  |                  |                     |                       |                | lb/g        | lbf/kN                   |                         | in/mm                          |
| <b>3L..SP1</b>    | 0.1898<br>4,821                       | 0.6250<br>15,875                      |  | 0.2031<br>5,159  | 0.2500<br>6,350  | 0.282<br>7,163      | 0.016<br>0,406        | 0.016<br>0,406 | 0.011<br>5  | 1 560<br>6,94            | 700<br>3,11             | 0.0001/0.0005<br>0,0025/0,0127 |
| <b>4A..SP3</b>    | 0.2500<br>6,350                       | 0.7500<br>19,050                      |  | 0.2188<br>5,558  | 0.3125<br>7,938  | 0.356<br>9,042      | 0.025<br>0,635        | 0.016<br>0,406 | 0.022<br>10 | 1 870<br>8,32            | 840<br>3,74             | 0.0001/0.0005<br>0,0025/0,0127 |
| <b>4A..SP4</b>    | 0.2500<br>6,350                       | 0.7500<br>19,050                      |  | 0.2188<br>5,558  | 0.4375<br>11,113 | 0.356<br>9,042      | 0.025<br>0,635        | 0.016<br>0,406 | 0.024<br>11 | 1 870<br>8,32            | 840<br>3,74             | 0.0001/0.0005<br>0,0025/0,0127 |
| <b>4A..SP5</b>    | 0.2498<br>6,345                       | 0.7503<br>19,058                      |  | 0.2190<br>5,563  | 0.2810<br>7,137  | 0.346<br>8,788      | 0.015<br>0,381        | 0.015<br>0,381 | 0.018<br>8  | 1 870<br>8,32            | 840<br>3,74             | 0.0001/0.0005<br>0,0025/0,0127 |
| <b>4..SP4</b>     | 0.2498<br>6,345                       | 0.9017<br>22,903                      |  | 0.3350<br>8,509  | 0.4840<br>12,294 | 0.431<br>10,947     | 0.040<br>1,016        | 0.030<br>0,762 | 0.042<br>19 | 2 930<br>13,03           | 1 310<br>5,83           | 0.0001/0.0005<br>0,0025/0,0127 |
| <b>6A..SP7</b>    | 0.3750<br>9,525                       | 0.8750<br>22,225                      |  | 0.2188<br>5,558  | 0.3125<br>7,938  | 0.481<br>12,217     | 0.030<br>0,762        | 0.016<br>0,406 | 0.026<br>12 | 2 500<br>11,12           | 1 120<br>4,98           | 0.0001/0.0005<br>0,0025/0,0127 |
| <b>6A..SP8</b>    | 0.3750<br>9,525                       | 0.8750<br>22,225                      |  | 0.2188<br>5,558  | 0.4375<br>11,113 | 0.481<br>12,217     | 0.025<br>0,635        | 0.016<br>0,406 | 0.029<br>13 | 2 500<br>11,12           | 1 120<br>4,98           | 0.0001/0.0005<br>0,0025/0,0127 |
| <b>6A..SP11</b>   | 0.3750<br>9,525                       | 0.8750<br>22,225                      |  | 0.2188<br>5,558  | 0.5000<br>12,700 | 0.481<br>12,217     | 0.025<br>0,635        | 0.016<br>0,406 | 0.031<br>14 | 2 500<br>11,12           | 1 120<br>4,98           | 0.0001/0.0005<br>0,0025/0,0127 |
| <b>8A..SP2</b>    | 0.5000<br>12,700                      | 1.1250<br>28,575                      |  | 0.2500<br>6,350  | 0.3750<br>9,525  | 0.640<br>16,256     | 0.035<br>0,889        | 0.015<br>0,381 | 0.053<br>24 | 3 900<br>17,35           | 1 740<br>7,74           | 0.0001/0.0007<br>0,0025/0,0178 |
| <b>8..SP2</b>     | 0.4998<br>12,695                      | 1.6878<br>42,870                      |  | 0.5000<br>12,700 | 0.6200<br>15,748 | 0.750<br>19,050     | 0.035<br>0,889        | 0.035<br>0,889 | 0.218<br>99 | 11 800<br>52,49          | 5 270<br>23,44          | 0.0001/0.0007<br>0,0025/0,0178 |
| <b>10A..SP6</b>   | 0.6250<br>15,875                      | 1.3750<br>34,925                      |  | 0.2813<br>7,145  | 0.4063<br>10,320 | 0.810<br>20,574     | 0.033<br>0,838        | 0.031<br>0,787 | 0.088<br>40 | 5 970<br>26,56           | 2 670<br>11,88          | 0.0001/0.0007<br>0,0025/0,0178 |



## Designation system

Examples: ZWKP 8APSP2G81CP55RP01  
KP 4SP4

ZW KP 8 A P SP2 G81 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW** Cadmium plated corrosion-resistant steel  
**SZW** Zinc-nickel plated corrosion-resistant steel

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Shield and seal

**No code** Sealed  
**P** Shielded

### Lubricant

**No code** Grease G354  
**G81** Grease G395

### Passivation

**No code** Not treated  
**CP55<sup>1)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> Available only for corrosion-resistant steel material without other surface treatment

## 1.18 Deep groove ball bearing single row (inch dimensions)

B500.. bore code **538** to **542**

Technical specification

AS 7949

Product standard

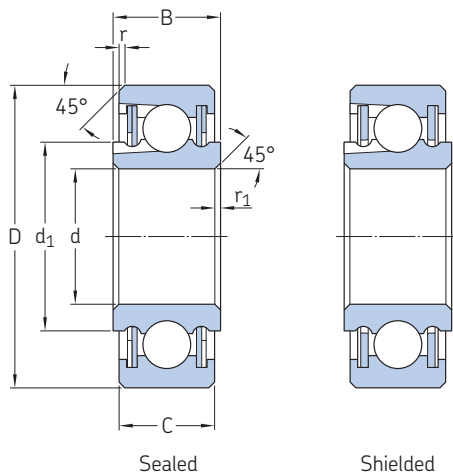
Standard tolerances:

AS 27646

Reduced clearance and

AS 21428

precision:



### Dimensions

| Nominal bore code | Dimensions d     | Δdmp Standard                      | Precision              | Δds Standard                       | D                | ΔDmp Standard          | Precision              | ΔDs                                |
|-------------------|------------------|------------------------------------|------------------------|------------------------------------|------------------|------------------------|------------------------|------------------------------------|
| –                 | in/mm            |                                    |                        |                                    |                  |                        |                        |                                    |
| <b>538</b>        | 0.6250<br>15,875 | +0.0007/–0.0007<br>+0,0178/–0,0178 | 0/–0.0005<br>0/–0,0127 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 1.0625<br>26,987 | 0/–0.0010<br>0/–0,0254 | 0/–0.0005<br>0/–0,0127 | +0.0005/–0.0015<br>+0,0127/–0,0381 |
| <b>539</b>        | 0.7500<br>19,050 | +0.0007/–0.0007<br>+0,0178/–0,0178 | 0/–0.0005<br>0/–0,0127 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 1.1875<br>30,163 | 0/–0.0010<br>0/–0,0254 | 0/–0.0005<br>0/–0,0127 | +0.0005/–0.0015<br>+0,0127/–0,0381 |
| <b>540</b>        | 0.8750<br>22,225 | +0.0007/–0.0007<br>+0,0178/–0,0178 | 0/–0.0005<br>0/–0,0127 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 1.3125<br>33,338 | 0/–0.0010<br>0/–0,0254 | 0/–0.0005<br>0/–0,0127 | +0.0005/–0.0015<br>+0,0127/–0,0381 |
| <b>541</b>        | 1.0625<br>26,987 | +0.0007/–0.0007<br>+0,0178/–0,0178 | 0/–0.0005<br>0/–0,0127 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 1.5000<br>38,100 | 0/–0.0010<br>0/–0,0254 | 0/–0.0005<br>0/–0,0127 | +0.0005/–0.0015<br>+0,0127/–0,0381 |
| <b>542</b>        | 1.3125<br>33,338 | +0.0007/–0.0007<br>+0,0178/–0,0178 | 0/–0.0005<br>0/–0,0127 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 1.7500<br>44,450 | 0/–0.0010<br>0/–0,0254 | 0/–0.0005<br>0/–0,0127 | +0.0005/–0.0015<br>+0,0127/–0,0381 |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions C   | ΔCs Standard         | Precision            | B              | ΔBs Standard         | Precision              | d1 ≈            | r1 +0.015/0 +0,381/0 | r +0.015/0 +0,381/0 | Mass ≈     | Tolerances Kia max Standard | Precision        | Kia max Precision | Kea max Standard | Precision |
|-------------------|----------------|----------------------|----------------------|----------------|----------------------|------------------------|-----------------|----------------------|---------------------|------------|-----------------------------|------------------|-------------------|------------------|-----------|
| –                 | in/mm          |                      |                      |                |                      |                        |                 |                      |                     | lb/g       | in/mm                       |                  |                   |                  |           |
| <b>538</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 0.777<br>19,736 | 0.015<br>0,381       | 0.015<br>0,381      | 0.03<br>14 | 0.0020<br>0,0508            | 0.0008<br>0,0203 | 0.0016<br>0,0406  | 0.0008<br>0,0203 |           |
| <b>539</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 0.895<br>22,733 | 0.015<br>0,381       | 0.015<br>0,381      | 0.04<br>18 | 0.0020<br>0,0508            | 0.0008<br>0,0203 | 0.0016<br>0,0406  | 0.0008<br>0,0203 |           |
| <b>540</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.016<br>25,806 | 0.015<br>0,381       | 0.015<br>0,381      | 0.05<br>23 | 0.0020<br>0,0508            | 0.0008<br>0,0203 | 0.0016<br>0,0406  | 0.0008<br>0,0203 |           |
| <b>541</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.216<br>30,886 | 0.015<br>0,381       | 0.015<br>0,381      | 0.06<br>27 | 0.0020<br>0,0508            | 0.0008<br>0,0203 | 0.0016<br>0,0406  | 0.0008<br>0,0203 |           |
| <b>542</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.451<br>36,855 | 0.015<br>0,381       | 0.015<br>0,381      | 0.09<br>41 | 0.0020<br>0,0508            | 0.0008<br>0,0203 | 0.0016<br>0,0406  | 0.0008<br>0,0203 |           |



## Designation system

Examples: ZWMB540DDSK2CP55RP01  
B538P

ZW M B 540 DDSK2 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances and radial clearance

**No code** Standard clearance and tolerances  
**M** Reduced clearance and precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                          | Lubricant | Version  |
|--------------------------|-----------|----------|
| <b>DDSK2</b>             | G354      | Sealed   |
| <b>DDS281</b>            | G395      | Sealed   |
| <b>PG81<sup>1)</sup></b> | G395      | Shielded |
| <b>P<sup>1)</sup></b>    | G354      | Shielded |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Over-size

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances       |                  |                  |                  | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup> |                                       | Radial clearance               |                                | Maximum starting torque <sup>5)</sup> |            |
|-------------------|------------------|------------------|------------------|------------------|-----------------------|----------------------|--------------------------------------------|---------------------------------------|--------------------------------|--------------------------------|---------------------------------------|------------|
|                   | Sia max          | Sea max          | Standard         | Precision        | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring      | Load fixed with respect to inner ring | Standard                       | Reduced                        | Shielded                              | Sealed     |
| –                 | in/mm            |                  |                  |                  | lbf/kN                |                      |                                            |                                       | in/mm                          |                                | oz-in/mNm                             |            |
| <b>538</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 3 280<br>14,60        | 1 500<br>6,67        | 1 990<br>8,85                              | 1 820<br>8,10                         | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 1.33<br>9,41                          | 2<br>14,12 |
| <b>539</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 3 750<br>16,68        | 1 700<br>7,56        | 2 050<br>9,12                              | 1 900<br>8,45                         | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 1.33<br>9,41                          | 2<br>14,12 |
| <b>540</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 4 220<br>18,77        | 1 900<br>8,45        | 2 110<br>9,39                              | 1 970<br>8,76                         | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 2<br>14,12                            | 3<br>21,18 |
| <b>541</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 5 000<br>22,24        | 2 200<br>9,79        | 2 170<br>9,65                              | 2 020<br>8,99                         | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 2.67<br>18,83                         | 4<br>28,25 |
| <b>542</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 5 950<br>26,47        | 2 700<br>12,01       | 2 220<br>9,88                              | 2 130<br>9,47                         | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 2.67<br>18,83                         | 4<br>28,25 |

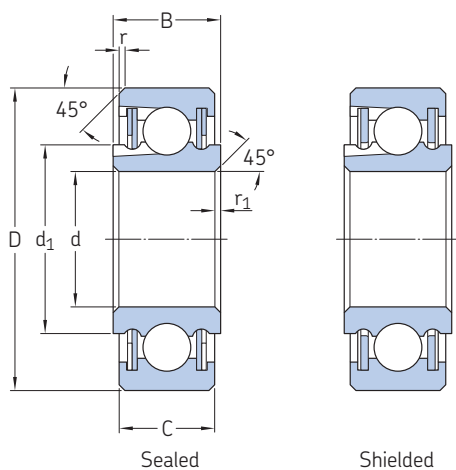
<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.18 Deep groove ball bearing single row (inch dimensions)

B500.. bore code **543** to **546**



|                                  |          |
|----------------------------------|----------|
| <b>Technical specification</b>   | AS 7949  |
| <b>Product standard</b>          |          |
| Standard tolerances:             | AS 27646 |
| Reduced clearance and precision: | AS 21428 |

### Dimensions

| Nominal bore code | Dimensions       |                                    | Precision              | $\Delta ds$ Standard               | D                | $\Delta Dmp$ Standard  | Precision              | $\Delta Ds$                        |
|-------------------|------------------|------------------------------------|------------------------|------------------------------------|------------------|------------------------|------------------------|------------------------------------|
|                   | d                | $\Delta dmp$ Standard              |                        |                                    |                  |                        |                        |                                    |
| –                 | in/mm            |                                    |                        |                                    |                  |                        |                        |                                    |
| <b>543</b>        | 1.5625<br>39,687 | +0.0007/–0.0007<br>+0,0178/–0,0178 | 0/–0.0005<br>0/–0,0127 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 2.0000<br>50,800 | 0/–0.0010<br>0/–0,0254 | 0/–0.0005<br>0/–0,0127 | +0.0005/–0.0015<br>+0,0127/–0,0381 |
| <b>544</b>        | 1.8125<br>46,037 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 0/–0.0008<br>0/–0,0203 | +0.0016/–0.0016<br>+0,0406/–0,0406 | 2.2500<br>57,150 | 0/–0.0015<br>0/–0,0381 | 0/–0.0007<br>0/–0,0178 | +0.0008/–0.0023<br>+0,0203/–0,0584 |
| <b>545</b>        | 2.0625<br>52,387 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 0/–0.0008<br>0/–0,0203 | +0.0016/–0.0016<br>+0,0406/–0,0406 | 2.6250<br>66,675 | 0/–0.0015<br>0/–0,0381 | 0/–0.0007<br>0/–0,0178 | +0.0008/–0.0023<br>+0,0203/–0,0584 |
| <b>546</b>        | 2.3125<br>58,737 | +0.0010/–0.0010<br>+0,0254/–0,0254 | 0/–0.0008<br>0/–0,0203 | +0.0016/–0.0016<br>+0,0406/–0,0406 | 2.8750<br>73,025 | 0/–0.0015<br>0/–0,0381 | 0/–0.0007<br>0/–0,0178 | +0.0008/–0.0023<br>+0,0203/–0,0584 |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions     |                      | Precision            | B              | $\Delta Bs$ Standard | Precision              | $d_1$ ≈         | $r_1$ +0.015/0 +0,381/0 | r +0.015/0 +0,381/0 | Mass ≈     | Tolerances       |                  |                  |                  |
|-------------------|----------------|----------------------|----------------------|----------------|----------------------|------------------------|-----------------|-------------------------|---------------------|------------|------------------|------------------|------------------|------------------|
|                   | C              | $\Delta Cs$ Standard |                      |                |                      |                        |                 |                         |                     |            | Kia max Standard | Precision        | Kea max Standard | Precision        |
| –                 | in/mm          |                      |                      |                |                      |                        |                 |                         |                     | lb/g       | in/mm            |                  |                  |                  |
| <b>543</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.702<br>43,231 | 0.015<br>0,381          | 0.015<br>0,381      | 0.10<br>45 | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>544</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 1.970<br>50,038 | 0.015<br>0,381          | 0.015<br>0,381      | 0.11<br>50 | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>545</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 2.286<br>58,064 | 0.015<br>0,381          | 0.015<br>0,381      | 0.15<br>68 | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |
| <b>546</b>        | 0.250<br>6,350 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 | 0.281<br>7,137 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 2.527<br>64,186 | 0.015<br>0,381          | 0.015<br>0,381      | 0.17<br>77 | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 |

**Designation system**Examples: ZWMB540DDSK2CP55RP01  
B538P

ZW M B 540 DDSK2 CP55 RP01

**Material and surface treatment**

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

**Tolerances and radial clearance**

**No code** Standard clearance and tolerances  
**M** Reduced clearance and precision

**Basic designation****Bore code** (multiples of 1/16<sup>th</sup> inch)**Variation**

|                          | <b>Lubricant</b> | <b>Version</b> |
|--------------------------|------------------|----------------|
| <b>DDSK2</b>             | G354             | Sealed         |
| <b>DDSK281</b>           | G395             | Sealed         |
| <b>PG81<sup>1)</sup></b> | G395             | Shielded       |
| <b>P<sup>1)</sup></b>    | G354             | Shielded       |

**Passivation**

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

**Oversize**

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment**Tolerances cont., loads, clearance and torque**

| Nominal bore code | Tolerances       |                  |                  |                  | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup> |                                       | Radial clearance               |                                | Maximum starting torque <sup>5)</sup> |            |
|-------------------|------------------|------------------|------------------|------------------|-----------------------|----------------------|--------------------------------------------|---------------------------------------|--------------------------------|--------------------------------|---------------------------------------|------------|
|                   | Sia max          | Sea max          | Precision        | Precision        | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring      | Load fixed with respect to inner ring | Standard                       | Reduced                        | Shielded                              | Sealed     |
| —                 | in/mm            |                  |                  |                  | lbf/kN                |                      |                                            |                                       | in/mm                          |                                | oz-in/mNm                             |            |
| <b>543</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 6 880<br>30,60        | 3 200<br>14,23       | 2 260<br>10,05                             | 2 180<br>9,70                         | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 3.33<br>23,53                         | 5<br>35,31 |
| <b>544</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 7 980<br>35,50        | 3 600<br>16,01       | 2 300<br>10,23                             | 2 220<br>9,88                         | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 3.33<br>23,53                         | 6<br>42,36 |
| <b>545</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 9 220<br>41,01        | 4 000<br>17,79       | 2 340<br>10,41                             | 2 260<br>10,05                        | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 4<br>28,25                            | 7<br>49,42 |
| <b>546</b>        | 0.0020<br>0,0508 | 0.0008<br>0,0203 | 0.0016<br>0,0406 | 0.0008<br>0,0203 | 10 150<br>45,15       | 4 400<br>19,57       | 2 360<br>10,50                             | 2 280<br>10,14                        | 0.0008/0.0018<br>0,0203/0,0457 | 0.0001/0.0005<br>0,0025/0,0127 | 4<br>28,25                            | 8<br>56,48 |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38<sup>4)</sup> If G395 load rating is 20% lower<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.19 Deep groove ball bearing double row (inch dimensions)

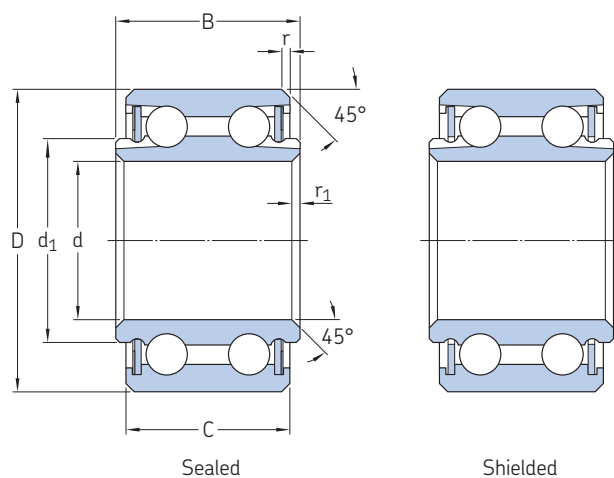
B5500..

Technical specification

–

Product standard

–



### Dimensions

| Nominal<br>bore<br>code | Dimensions |           |        |           |        |           |        |           |                     |                                        |                           |
|-------------------------|------------|-----------|--------|-----------|--------|-----------|--------|-----------|---------------------|----------------------------------------|---------------------------|
|                         | d          | Δdmp      | D      | Δ Dmp     | C      | Δ Cs      | B      | Δ Bs      | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0.020/0<br>+0,508/0 | r<br>+0.020/0<br>+0,508/0 |
| –                       | in/mm      |           |        |           |        |           |        |           |                     |                                        |                           |
| 5538                    | 0.6250     | 0/−0.0005 | 1.0625 | 0/−0.0005 | 0.500  | 0/−0.005  | 0.562  | 0/−0.005  | 0.740               | 0.015                                  | 0.015                     |
|                         | 15,875     | 0/−0,0127 | 26,987 | 0/−0,0127 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 18,796              | 0,381                                  | 0,381                     |
| 5539                    | 0.7500     | 0/−0.0005 | 1.1875 | 0/−0.0005 | 0.500  | 0/−0.005  | 0.562  | 0/−0.0005 | 0.858               | 0.015                                  | 0.015                     |
|                         | 19,050     | 0/−0,0127 | 30,163 | 0/−0,0127 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 21,793              | 0,381                                  | 0,381                     |
| 5540                    | 0.8750     | 0/−0.0005 | 1.3125 | 0/−0.0005 | 0.500  | 0/−0.005  | 0.562  | 0/−0.005  | 0.976               | 0.015                                  | 0.015                     |
|                         | 22,225     | 0/−0,0127 | 33,338 | 0/−0,0127 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 24,779              | 0,381                                  | 0,381                     |
| 5541                    | 1.0625     | 0/−0.0005 | 1.5000 | 0/−0.0005 | 0.500  | 0/−0.005  | 0.562  | 0/−0.005  | 1.173               | 0.015                                  | 0.015                     |
|                         | 26,987     | 0/−0,0127 | 38,100 | 0/−0,0127 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 29,794              | 0,381                                  | 0,381                     |
| 5542                    | 1.3125     | 0/−0.0005 | 1.7500 | 0/−0.0005 | 0.500  | 0/−0.005  | 0.562  | 0/−0.005  | 1.417               | 0.015                                  | 0.015                     |
|                         | 33,338     | 0/−0,0127 | 44,450 | 0/−0,0127 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 35,992              | 0,381                                  | 0,381                     |
| 5543                    | 1.5625     | 0/−0.0005 | 2.0000 | 0/−0.0005 | 0.500  | 0/−0.005  | 0.562  | 0/−0.005  | 1.673               | 0.015                                  | 0.015                     |
|                         | 39,687     | 0/−0,0127 | 50,800 | 0/−0,0127 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 42,494              | 0,381                                  | 0,381                     |
| 5544                    | 1.8125     | 0/−0.0008 | 2.2500 | 0/−0.0007 | 0.500  | 0/−0.005  | 0.562  | 0/−0.005  | 1.949               | 0.015                                  | 0.015                     |
|                         | 46,037     | 0/−0,0203 | 57,150 | 0/−0,0178 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 49,505              | 0,381                                  | 0,381                     |
| 5545                    | 2.0625     | 0/−0.0008 | 2.6250 | 0/−0.0007 | 0.500  | 0/−0.0005 | 0.562  | 0/−0.0005 | 2.264               | 0.015                                  | 0.015                     |
|                         | 52,387     | 0/−0,0203 | 66,675 | 0/−0,0178 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 57,506              | 0,381                                  | 0,381                     |
| 5546                    | 2.3125     | 0/−0.0008 | 2.8750 | 0/−0.0007 | 0.500  | 0/−0.005  | 0.562  | 0/−0.005  | 2.508               | 0.015                                  | 0.015                     |
|                         | 58,737     | 0/−0,0203 | 73,025 | 0/−0,0178 | 12,700 | 0/−0,127  | 14,270 | 0/−0,127  | 63,703              | 0,381                                  | 0,381                     |



## Designation system

Examples: ZWB5540DDSK2CP55RP01  
B5538P

ZW B 5540 DDSK2 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW** Cadmium plated corrosion-resistant steel  
**SZW** Zinc-nickel plated corrosion-resistant steel

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|        | Lubricant | Version  |
|--------|-----------|----------|
| DDSK2  | G354      | Sealed   |
| DDS281 | G395      | Sealed   |
| PG81   | G395      | Shielded |
| P      | G354      | Shielded |

### Passivation

**No code** Not treated  
**CP55<sup>1)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

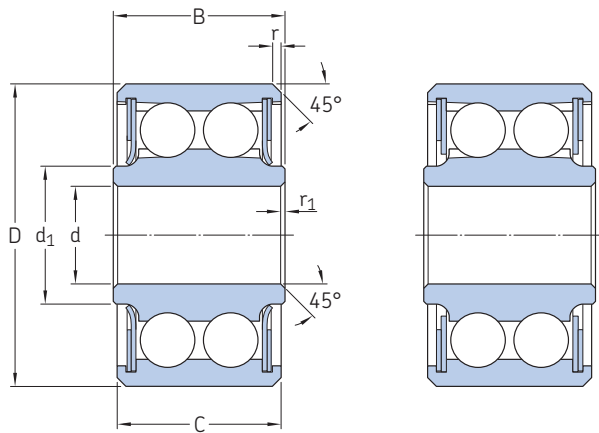
## Tolerances, loads and clearance

| Nominal bore code | Mass ≈      | Tolerances<br>Kia max | Kea max          | Sia max          | Sea max          | Static limit loads<br>Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | Radial clearance               |
|-------------------|-------------|-----------------------|------------------|------------------|------------------|------------------------------------------------|-------------------------|--------------------------------|
| –                 | lb/g        | in/mm                 |                  |                  |                  | lbf/kN                                         |                         | in/mm                          |
| 5538              | 0.04<br>18  | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 6 250<br>27,80                                 | 2 060<br>9,16           | 0.0008/0.0018<br>0,0203/0,0457 |
| 5539              | 0.06<br>27  | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 7 190<br>31,98                                 | 2 370<br>10,54          | 0.0008/0.0018<br>0,0203/0,0457 |
| 5540              | 0.08<br>36  | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 8 120<br>36,12                                 | 2 680<br>11,92          | 0.0008/0.0018<br>0,0203/0,0457 |
| 5541              | 0.10<br>45  | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 9 690<br>43,10                                 | 3 200<br>14,23          | 0.0008/0.0018<br>0,0203/0,0457 |
| 5542              | 0.14<br>64  | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 11 600<br>52,00                                | 3 820<br>16,99          | 0.0008/0.0018<br>0,0203/0,0457 |
| 5543              | 0.16<br>73  | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 13 400<br>59,61                                | 4 430<br>19,70          | 0.0008/0.0018<br>0,0203/0,0457 |
| 5544              | 0.18<br>82  | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 15 600<br>69,39                                | 5 160<br>22,95          | 0.0008/0.0018<br>0,0203/0,0457 |
| 5545              | 0.26<br>118 | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 18 100<br>80,51                                | 5 980<br>26,60          | 0.0008/0.0018<br>0,0203/0,0457 |
| 5546              | 0.30<br>136 | 0.0020<br>0,0508      | 0.0016<br>0,0406 | 0.0020<br>0,0508 | 0.0016<br>0,0406 | 20 000<br>88,96                                | 6 600<br>29,36          | 0.0008/0.0018<br>0,0203/0,0457 |

## 1.20 Deep groove ball bearing double row (inch dimensions)

DPP..

Technical specification AS 7949  
Product standard AS 27644



### Dimensions

| Nominal<br>bore<br>code | Dimensions |                  |                        |                 | D      | ΔDmp      |                        | ΔDs             | C      | ΔCs      |                        |  |
|-------------------------|------------|------------------|------------------------|-----------------|--------|-----------|------------------------|-----------------|--------|----------|------------------------|--|
|                         | d          | Δdmp<br>Standard | SKF super<br>precision | Δds             |        | Standard  | SKF super<br>precision |                 |        | Standard | SKF super<br>precision |  |
| –                       | in/mm      |                  |                        |                 |        |           |                        |                 |        |          |                        |  |
| 3                       | 0.1900     | 0/-0.0005        | 0/-0.0003              | +0.0002/-0.0007 | 0.7774 | 0/-0.0005 | 0/-0.0004              | +0.0005/-0.0010 | 0.473  | 0/-0.005 | 0/-0.005               |  |
|                         | 4,826      | 0/-0,0127        | 0/-0,0076              | +0,0050/-0,0178 | 19,745 | 0/-0,0127 | 0/-0,0101              | +0,0127/-0,0254 | 12,014 | 0/-0,127 | 0/-0,127               |  |
| 4                       | 0.2500     | 0/-0.0005        | 0/-0.0003              | +0.0002/-0.0007 | 0.9014 | 0/-0.0005 | 0/-0.0004              | +0.0005/-0.0010 | 0.491  | 0/-0.005 | 0/-0.005               |  |
|                         | 6,350      | 0/-0,0127        | 0/-0,0076              | +0,0050/-0,0178 | 22,895 | 0/-0,0127 | 0/-0,0101              | +0,0127/-0,0254 | 12,471 | 0/-0,127 | 0/-0,127               |  |
| 5                       | 0.3125     | 0/-0.0005        | 0/-0.0003              | +0.0002/-0.0007 | 1.2500 | 0/-0.0005 | 0/-0.0004              | +0.0005/-0.0010 | 0.687  | 0/-0.005 | 0/-0.005               |  |
|                         | 7,938      | 0/-0,0127        | 0/-0,0076              | +0,0050/-0,0178 | 31,750 | 0/-0,0127 | 0/-0,0101              | +0,0127/-0,0254 | 17,449 | 0/-0,127 | 0/-0,127               |  |
| 6                       | 0.3750     | 0/-0.0005        | 0/-0.0003              | +0.0002/-0.0007 | 1.4375 | 0/-0.0005 | 0/-0.0004              | +0.0005/-0.0010 | 0.794  | 0/-0.005 | 0/-0.005               |  |
|                         | 9,525      | 0/-0,0127        | 0/-0,0076              | +0,0050/-0,0178 | 36,513 | 0/-0,0127 | 0/-0,0101              | +0,0127/-0,0254 | 20,167 | 0/-0,127 | 0/-0,127               |  |
| 8                       | 0.5000     | 0/-0.0005        | 0/-0.0003              | +0.0002/-0.0007 | 1.6875 | 0/-0.0005 | 0/-0.0004              | +0.0005/-0.0010 | 0.856  | 0/-0.005 | 0/-0.005               |  |
|                         | 12,700     | 0/-0,0127        | 0/-0,0076              | +0,0050/-0,0178 | 42,862 | 0/-0,0127 | 0/-0,0101              | +0,0127/-0,0254 | 21,742 | 0/-0,127 | 0/-0,127               |  |
| 10                      | 0.6250     | 0/-0.0005        | 0/-0.0003              | +0.0002/-0.0007 | 1.9375 | 0/-0.0005 | 0/-0.0004              | +0.0005/-0.0010 | 0.920  | 0/-0.005 | 0/-0.005               |  |
|                         | 15,875     | 0/-0,0127        | 0/-0,0076              | +0,0050/-0,0178 | 49,212 | 0/-0,0127 | 0/-0,0101              | +0,0127/-0,0254 | 23,368 | 0/-0,127 | 0/-0,127               |  |

### Dimensions cont. and tolerances

| Nominal<br>bore<br>code | Dimensions |                 |                        | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0.015/0<br>+0,381/0 | r<br>+0.015/0<br>+0,381/0 | Mass<br>≈ | Tolerances |        | Kea max<br>Standard | SKF super<br>precision | Sia max<br>Standard | SKF super<br>precision |  |
|-------------------------|------------|-----------------|------------------------|---------------------|----------------------------------------|---------------------------|-----------|------------|--------|---------------------|------------------------|---------------------|------------------------|--|
|                         | B          | ΔBs<br>Standard | SKF super<br>precision |                     |                                        |                           |           |            |        |                     |                        |                     |                        |  |
| –                       | in/mm      |                 |                        |                     |                                        |                           |           | lb/g       | in/mm  |                     |                        |                     |                        |  |
| 3                       | 0.495      | 0/−0.005        | 0/−0.0025              | 0.302               | 0.005                                  | 0.018                     | 0.04      | 0.0010     | 0.0005 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |  |
|                         | 12,573     | 0/−0.127        | 0/−0.0635              | 7,670               | 0.127                                  | 0.450                     | 18        | 0.0254     | 0.0127 | 0.0406              | 0.0203                 | 0.0254              | 0.0178                 |  |
| 4                       | 0.620      | 0/−0.005        | 0/−0.0025              | 0.410               | 0.005                                  | 0.032                     | 0.06      | 0.0010     | 0.0005 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |  |
|                         | 15,748     | 0/−0.127        | 0/−0.0635              | 10,414              | 0.127                                  | 0.813                     | 27        | 0.0254     | 0.0127 | 0.0406              | 0.0203                 | 0.0254              | 0.0178                 |  |
| 5                       | 0.745      | 0/−0.005        | 0/−0.0025              | 0.469               | 0.015                                  | 0.032                     | 0.17      | 0.0010     | 0.0005 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |  |
|                         | 18,923     | 0/−0.127        | 0/−0.0635              | 11,912              | 0.381                                  | 0.813                     | 77        | 0.0254     | 0.0127 | 0.0406              | 0.0203                 | 0.0254              | 0.0178                 |  |
| 6                       | 0.870      | 0/−0.005        | 0/−0.0025              | 0.551               | 0.015                                  | 0.032                     | 0.26      | 0.0010     | 0.0005 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |  |
|                         | 22,098     | 0/−0.127        | 0/−0.0635              | 13,995              | 0.381                                  | 0.813                     | 118       | 0.0254     | 0.0127 | 0.0406              | 0.0203                 | 0.0254              | 0.0178                 |  |
| 8                       | 0.932      | 0/−0.005        | 0/−0.0025              | 0.735               | 0.015                                  | 0.044                     | 0.38      | 0.0010     | 0.0005 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |  |
|                         | 23,672     | 0/−0.127        | 0/−0.0635              | 18,669              | 0.381                                  | 1.118                     | 172       | 0.0254     | 0.0127 | 0.0406              | 0.0203                 | 0.0254              | 0.0178                 |  |
| 10                      | 0.995      | 0/−0.005        | 0/−0.0025              | 0.890               | 0.015                                  | 0.044                     | 0.53      | 0.0010     | 0.0005 | 0.0016              | 0.0008                 | 0.0010              | 0.0007                 |  |
|                         | 25,273     | 0/−0.127        | 0/−0.0635              | 22,606              | 0.381                                  | 1.118                     | 240       | 0.0254     | 0.0127 | 0.0406              | 0.0203                 | 0.0254              | 0.0178                 |  |



**Designation system**

Examples: ZWMDPP10SK2CP55RP01  
DPP 3P

ZW M DDP 10 SK2 CP55 RP01

**Material and surface treatment**

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

**Tolerances**

**No code** Standard tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

**Basic designation**

**Bore code** (multiples of 1/16<sup>th</sup> inch)

**Variation**

|                      | Lubricant | Version  | Radial clearance<br>DPP.. | MDPP.. <sup>1)</sup> |
|----------------------|-----------|----------|---------------------------|----------------------|
| SK2                  | G354      | Sealed   | Standard                  | Reduced              |
| S281                 | G395      | Sealed   | Standard                  | Reduced              |
| S281-R <sup>1)</sup> | G395      | Sealed   | Reduced                   | –                    |
| SK2-R <sup>1)</sup>  | G354      | Sealed   | Reduced                   | –                    |
| P <sup>1)</sup>      | G354      | Shielded | Standard                  | Reduced              |
| PG81 <sup>1)</sup>   | G395      | Shielded | Standard                  | Reduced              |
| PG81-R <sup>1)</sup> | G395      | Shielded | Reduced                   | –                    |
| P-R <sup>1)</sup>    | G354      | Shielded | Reduced                   | –                    |

**Passivation**

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

**Oversize**

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

**Tolerances cont., loads, clearance and torque**

| Nominal bore code | Tolerances       |                     | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup>       |        | Radial clearance |                | Maximum starting torque <sup>5)</sup> |        |
|-------------------|------------------|---------------------|-----------------------|----------------------|--------------------------------------------------|--------|------------------|----------------|---------------------------------------|--------|
|                   | Sea max Standard | SKF super precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring inner ring |        | Standard         | Reduced        | Shielded                              | Sealed |
| –                 | in/mm            |                     | lbf/kN                |                      |                                                  |        | in/mm            |                | oz-in/mNm                             |        |
| 3                 | 0,0016           | 0,0010              | 2 950                 | 1 700                | 2 950                                            | 2 830  | 0,0004/ 0,0010   | 0,0002/ 0,0005 | 0,67                                  | 1      |
|                   | 0,0406           | 0,0254              | 13,12                 | 7,56                 | 13,12                                            | 12,59  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 4,71                                  | 7,06   |
| 4                 | 0,0016           | 0,0010              | 5 370                 | 1 800                | 3 550                                            | 3 020  | 0,0004/ 0,0010   | 0,0002/ 0,0005 | 0,67                                  | 1      |
|                   | 0,0406           | 0,0254              | 23,89                 | 8,01                 | 15,79                                            | 13,43  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 4,71                                  | 7,06   |
| 5                 | 0,0016           | 0,0010              | 11 000                | 4 000                | 7 360                                            | 6 250  | 0,0004/ 0,0010   | 0,0002/ 0,0005 | 0,67                                  | 1,5    |
|                   | 0,0406           | 0,0254              | 48,93                 | 17,79                | 32,74                                            | 27,80  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 4,71                                  | 10,59  |
| 6                 | 0,0016           | 0,0010              | 15 760                | 5 300                | 9 690                                            | 8 120  | 0,0004/ 0,0010   | 0,0002/ 0,0005 | 1,33                                  | 2      |
|                   | 0,0406           | 0,0254              | 70,10                 | 23,58                | 43,10                                            | 36,12  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 9,41                                  | 14,12  |
| 8                 | 0,0016           | 0,0010              | 23 600                | 7 800                | 14 100                                           | 11 600 | 0,0004/ 0,0010   | 0,0002/ 0,0005 | 1,33                                  | 3      |
|                   | 0,0406           | 0,0254              | 105,00                | 34,70                | 62,72                                            | 51,60  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 9,41                                  | 21,18  |
| 10                | 0,0016           | 0,0010              | 28 400                | 9 400                | 15 300                                           | 13 100 | 0,0004/ 0,0010   | 0,0002/ 0,0005 | 2                                     | 4,5    |
|                   | 0,0406           | 0,0254              | 126,33                | 41,81                | 68,06                                            | 58,27  | 0,0101/ 0,0254   | 0,0051/ 0,0127 | 14,12                                 | 31,78  |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

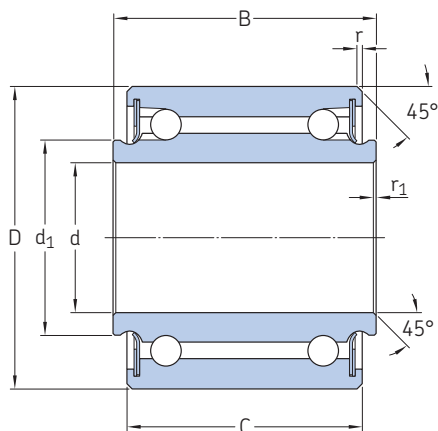
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.21 Deep groove ball bearing double row (inch dimensions)

DW., DW..K, DW..K2

Technical specification AS 7949  
Product standard AS 27647



### Dimensions

| Nominal bore code | Dimensions       | Δdmp Standard          | SKF super precision    | Δds                                | D                | ΔDmp Standard          | SKF super precision    | ΔDs                                | C               | ΔCs Standard         | SKF super precision  |
|-------------------|------------------|------------------------|------------------------|------------------------------------|------------------|------------------------|------------------------|------------------------------------|-----------------|----------------------|----------------------|
| –                 | in/mm            |                        |                        |                                    |                  |                        |                        |                                    |                 |                      |                      |
| <b>4K2</b>        | 0.2500<br>6,350  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.6250<br>15,875 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.500<br>12,700 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>4K</b>         | 0.2500<br>6,350  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.7500<br>19,050 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.750<br>19,050 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>41)</b>        | 0.2500<br>6,350  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.7500<br>19,050 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.750<br>19,050 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>5</b>          | 0.3125<br>7,938  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.8750<br>22,225 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.813<br>20,650 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>6</b>          | 0.3750<br>9,525  | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 1.0625<br>26,988 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 1.063<br>27,000 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>8</b>          | 0.5000<br>12,700 | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 1.4375<br>36,513 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 1.375<br>34,925 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions      | ΔBs Standard         | SKF super precision    | d <sub>1</sub> ≈ | r <sub>1</sub> +0.015/0 +0,381/0 | r +0.015/0 +0,381/0 | Mass ≈      | Tolerances       | Kea max Standard | SKF super precision | Sia max Standard | SKF super precision |
|-------------------|-----------------|----------------------|------------------------|------------------|----------------------------------|---------------------|-------------|------------------|------------------|---------------------|------------------|---------------------|
| –                 | in/mm           |                      |                        |                  |                                  |                     | lb/g        | in/mm            |                  |                     |                  |                     |
| <b>4K2</b>        | 0.562<br>14,275 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.344<br>8,738   | 0.005<br>0,127                   | 0.016<br>0,406      | 0.025<br>11 | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406    | 0.0008<br>0,0203 | 0.0010<br>0,0254    |
| <b>4K</b>         | 0.875<br>22,225 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.385<br>9,779   | 0.005<br>0,127                   | 0.016<br>0,406      | 0.04<br>18  | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406    | 0.0008<br>0,0203 | 0.0010<br>0,0254    |
| <b>41)</b>        | 0.875<br>22,225 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.375<br>9,525   | 0.005<br>0,127                   | 0.016<br>0,406      | 0.06<br>27  | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406    | 0.0008<br>0,0203 | 0.0010<br>0,0254    |
| <b>5</b>          | 0.938<br>23,825 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.472<br>11,989  | 0.005<br>0,127                   | 0.016<br>0,406      | 0.07<br>32  | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406    | 0.0008<br>0,0203 | 0.0010<br>0,0254    |
| <b>6</b>          | 1.188<br>30,175 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.576<br>14,630  | 0.005<br>0,127                   | 0.016<br>0,406      | 0.12<br>54  | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406    | 0.0008<br>0,0203 | 0.0010<br>0,0254    |
| <b>8</b>          | 1.500<br>38,100 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.715<br>18,161  | 0.005<br>0,127                   | 0.032<br>0,813      | 0.29<br>132 | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406    | 0.0008<br>0,0203 | 0.0010<br>0,0254    |



## Designation system

Examples: ZWMDW 6SK2CP55RP01  
DW 4K2S281-R

ZW M DW 6 SK2 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances

**No code** Standard tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|               | Lubricant | Version | Radial clearance<br>DW.. | MDW.. <sup>1)</sup> |
|---------------|-----------|---------|--------------------------|---------------------|
| <b>SK2</b>    | G354      | Sealed  | Standard                 | Reduced             |
| <b>S281</b>   | G395      | Sealed  | Standard                 | Reduced             |
| <b>S281-R</b> | G395      | Sealed  | Reduced                  | –                   |
| <b>SK2-R</b>  | G354      | Sealed  | Reduced                  | –                   |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code     | Tolerances       |                     | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup>       |                | Radial clearance       |                                  | Maximum starting torque <sup>5)</sup> |
|-----------------------|------------------|---------------------|-----------------------|----------------------|--------------------------------------------------|----------------|------------------------|----------------------------------|---------------------------------------|
|                       | Sea max Standard | SKF super precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring inner ring |                | Standard               | Reduced                          |                                       |
| –                     | in/mm            |                     | lbf/kN                |                      |                                                  |                | in/mm                  |                                  | oz-in/mNm                             |
| <b>4K2</b>            | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 1 400<br>6,23         | 500<br>2,22          | 1 050<br>4,67                                    | 960<br>4,27    | 0/ 0.0010<br>0/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 1<br>7,06                             |
| <b>4K</b>             | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 2 770<br>12,32        | 900<br>4,00          | 2 070<br>9,21                                    | 1 850<br>8,23  | 0/ 0.0010<br>0/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 1<br>7,06                             |
| <b>4<sup>1)</sup></b> | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 3 750<br>16,68        | 1 240<br>5,52        | 2 070<br>9,21                                    | 1 850<br>8,23  | 0/ 0.0010<br>0/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 1<br>7,06                             |
| <b>5</b>              | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 5 140<br>22,86        | 1 600<br>7,12        | 2 600<br>11,57                                   | 2 320<br>10,32 | 0/ 0.0010<br>0/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 1.5<br>10,59                          |
| <b>6</b>              | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 8 440<br>37,54        | 2 600<br>11,57       | 4 220<br>18,77                                   | 3 740<br>16,64 | 0/ 0.0010<br>0/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 2.5<br>17,65                          |
| <b>8</b>              | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 15 520<br>69,04       | 4 700<br>20,91       | 7 610<br>33,85                                   | 6 520<br>29,00 | 0/ 0.0010<br>0/ 0,0254 | 0.0002/ 0.0005<br>0,0051/ 0,0127 | 2.5<br>17,65                          |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

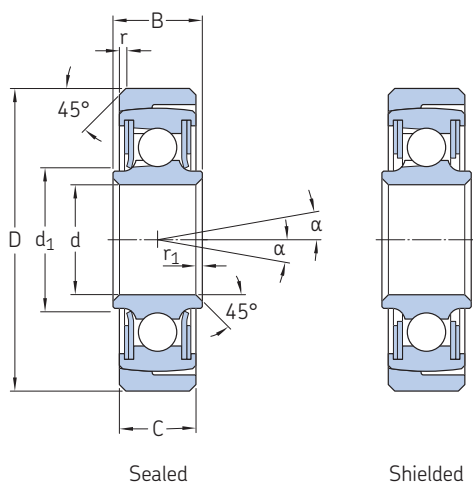
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G354. When using G395, values are 20% higher

## 1.22 Deep groove ball bearing with self-aligning ring single row (inch dimensions)

KP..BS bore code **16** to **21**

Technical specification AS 7949  
Product standard AS 27648



### Dimensions

| Nominal bore code | Dimensions       | $\Delta$ mp Standard   | SKF super precision                | $\Delta$ ds                        | D                | $\Delta$ Dmp Standard  | SKF super precision    | $\Delta$ Ds                        | C              | $\Delta$ Cs Standard | SKF super precision  |
|-------------------|------------------|------------------------|------------------------------------|------------------------------------|------------------|------------------------|------------------------|------------------------------------|----------------|----------------------|----------------------|
| –                 | in/mm            |                        |                                    |                                    |                  |                        |                        |                                    |                |                      |                      |
| <b>16</b>         | 1.0000<br>25,400 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127             | +0.0003/-0.0008<br>+0,0076/-0,0203 | 1.9375<br>49,212 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 | 0.375<br>9,525 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>21</b>         | 1.3130<br>33,350 | 0/-0.0010<br>0/-0,0254 | -0.0005/-0.0010<br>-0,0127/-0,0254 | +0.0008/-0.0008<br>+0,0203/-0,0203 | 2.2500<br>57,150 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 | 0.375<br>9,525 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>23</b>         | 1.4380<br>36,525 | 0/-0.0010<br>0/-0,0254 | -0.0005/-0.0010<br>-0,0127/-0,0254 | +0.0008/-0.0008<br>+0,0203/-0,0203 | 2.3750<br>60,325 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 | 0.375<br>9,525 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>25</b>         | 1.5630<br>39,700 | 0/-0.0010<br>0/-0,0254 | -0.0005/-0.0010<br>-0,0127/-0,0254 | +0.0008/-0.0008<br>+0,0203/-0,0203 | 2.5000<br>63,500 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 | 0.375<br>9,525 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| <b>29</b>         | 1.8130<br>46,050 | 0/-0.0010<br>0/-0,0254 | -0.0005/-0.0010<br>-0,0127/-0,0254 | +0.0008/-0.0008<br>+0,0203/-0,0203 | 2.7500<br>69,850 | 0/-0.0010<br>0/-0,0254 | 0/-0.0010<br>0/-0,0254 | +0.0010/-0.0020<br>+0,0254/-0,0508 | 0.375<br>9,525 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |

### Dimensions cont. and tolerances

| Nominal<br>bore<br>code | Dimensions      |                      | SKF super<br>precision | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0.015/0<br>+0,381/0 | r<br>+0.015/0<br>+0,381/0 | α     | Mass<br>≈   | Tolerances          |                        | Kea max<br>Standard | SKF super<br>precision |
|-------------------------|-----------------|----------------------|------------------------|---------------------|----------------------------------------|---------------------------|-------|-------------|---------------------|------------------------|---------------------|------------------------|
|                         | B               | ΔBs<br>Standard      |                        |                     |                                        |                           |       |             | Kia max<br>Standard | SKF super<br>precision |                     |                        |
| –                       | in/mm           |                      |                        |                     |                                        |                           | °     | lb/g        | in/mm               |                        |                     |                        |
| 16                      | 0.437<br>11,099 | 0/−0.005<br>0/−0,127 | 0/−0.0025<br>0/−0,0635 | 1.141<br>28,981     | 0.0240<br>0,610                        | 0.0240<br>0,610           | 7°25′ | 0.18<br>82  | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 21                      | 0.437<br>11,099 | 0/−0.005<br>0/−0,127 | 0/−0.0025<br>0/−0,0635 | 1.454<br>36,931     | 0.0240<br>0,610                        | 0.0240<br>0,610           | 6°30′ | 0.20<br>90  | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 23                      | 0.437<br>11,099 | 0/−0.005<br>0/−0,127 | 0/−0.0025<br>0/−0,0635 | 1.574<br>39,979     | 0.0240<br>0,610                        | 0.0240<br>0,610           | 6°    | 0.22<br>99  | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 25                      | 0.437<br>11,099 | 0/−0.005<br>0/−0,127 | 0/−0.0025<br>0/−0,0635 | 1.693<br>43,002     | 0.0240<br>0,838                        | 0.0240<br>0,838           | 5°45′ | 0.25<br>113 | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 29                      | 0.437<br>11,099 | 0/−0.005<br>0/−0,127 | 0/−0.0025<br>0/−0,0635 | 1.931<br>49,047     | 0.0240<br>0,610                        | 0.0240<br>0,610           | 5°    | 0.27<br>122 | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |



## Designation system

Examples: ZWMKP16BSSK2CP55RP01  
KP29BSP

ZW M KP 16 BS SK2 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances and radial clearance

**No code** Standard clearance and tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                          | Lubricant | Version  |
|--------------------------|-----------|----------|
| <b>SK2</b>               | G354      | Sealed   |
| <b>S281</b>              | G395      | Sealed   |
| <b>PG81<sup>1)</sup></b> | G395      | Shielded |
| <b>P<sup>1)</sup></b>    | G354      | Shielded |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances       |                     |                  |                     | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup>       |                | Radial clearance                 |                                  | Maximum starting torque <sup>5)</sup> |             |
|-------------------|------------------|---------------------|------------------|---------------------|-----------------------|----------------------|--------------------------------------------------|----------------|----------------------------------|----------------------------------|---------------------------------------|-------------|
|                   | Sia max Standard | SKF super precision | Sea max Standard | SKF super precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring inner ring |                | Standard                         | Reduced                          | Shielded                              | Sealed      |
| –                 | in/mm            |                     |                  |                     | lbf/kN                |                      |                                                  |                | in/mm                            |                                  | oz-in/mNm                             |             |
| <b>16</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 8 085<br>35,96        | 1 600<br>7,12        | 4 260<br>18,95                                   | 3 960<br>17,61 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 3.33<br>23,53                         | 5<br>35,3   |
| <b>21</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 9 840<br>43,77        | 2 000<br>8,90        | 4 590<br>20,42                                   | 4 290<br>19,08 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 4.67<br>32,95                         | 7<br>49,42  |
| <b>23</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 10 500<br>46,71       | 2 200<br>9,79        | 4 650<br>20,68                                   | 4 360<br>19,39 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 5.33<br>37,65                         | 9<br>63,54  |
| <b>25</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 11 300<br>50,27       | 2 300<br>10,23       | 4 680<br>20,82                                   | 4 420<br>19,66 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 6<br>42,37                            | 9<br>63,54  |
| <b>29</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 12 700<br>56,49       | 2 600<br>11,57       | 4 760<br>21,17                                   | 4 530<br>20,15 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 8<br>56,48                            | 14<br>98,84 |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

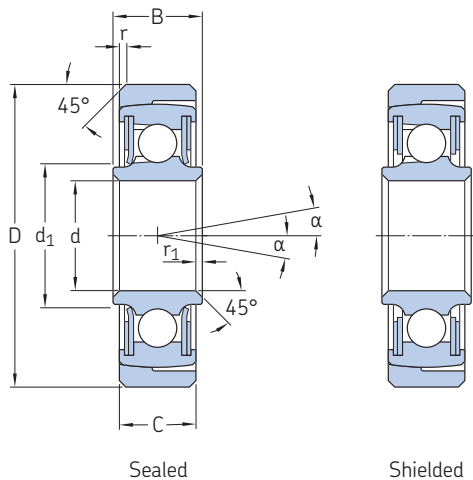
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.22 Deep groove ball bearing with self-aligning ring single row (inch dimensions)

KP..BS bore code **33** to **49**

Technical specification AS 7949  
Product standard AS 27648



### Dimensions

| Nominal bore code | Dimensions       | $\Delta$ mp Standard   | SKF super precision                | $\Delta$ ds                        | D                 | $\Delta$ Dmp Standard  | SKF super precision    | $\Delta$ Ds                        | C               | $\Delta$ Cs Standard | SKF super precision  |
|-------------------|------------------|------------------------|------------------------------------|------------------------------------|-------------------|------------------------|------------------------|------------------------------------|-----------------|----------------------|----------------------|
| –                 | in/mm            |                        |                                    |                                    |                   |                        |                        |                                    |                 |                      |                      |
| <b>33</b>         | 2.0630<br>52,400 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0127/–0,0381 | 3.0000<br>76,200  | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 | 0.375<br>9,525  | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 |
| <b>37</b>         | 2.3130<br>58,750 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | 3.2500<br>82,550  | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 | 0.375<br>9,525  | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 |
| <b>47</b>         | 2.9380<br>74,625 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | 4.1250<br>104,775 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 | 0.469<br>11,912 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 |
| <b>48</b>         | 3.0005<br>76,213 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | 4.2500<br>107,950 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 | 0.469<br>11,912 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 |
| <b>49</b>         | 3.0630<br>77,800 | 0/–0.0010<br>0/–0,0254 | –0.0005/–0.0010<br>–0,0127/–0,0254 | +0.0008/–0.0008<br>+0,0203/–0,0203 | 4.2500<br>107,950 | 0/–0.0010<br>0/–0,0254 | 0/–0.0010<br>0/–0,0254 | +0.0010/–0.0020<br>+0,0254/–0,0508 | 0,469<br>11,912 | 0/–0.005<br>0/–0,127 | 0/–0.005<br>0/–0,127 |

### Dimensions cont. and tolerances

| Nominal<br>bore<br>code | Dimensions      |                      | SKF super<br>precision | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0.015/0<br>+0,381/0 | r<br>+0.015/0<br>+0,381/0 | α     | Mass<br>≈   | Tolerances          |                        |                     |                        |
|-------------------------|-----------------|----------------------|------------------------|---------------------|----------------------------------------|---------------------------|-------|-------------|---------------------|------------------------|---------------------|------------------------|
|                         | B               | ΔBs<br>Standard      |                        |                     |                                        |                           |       |             | Kia max<br>Standard | SKF super<br>precision | Kea max<br>Standard | SKF super<br>precision |
| –                       | in/mm           |                      |                        |                     |                                        |                           | °     | lb/g        | in/mm               |                        |                     |                        |
| 33                      | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 2.231<br>56,667     | 0.0240<br>0,610                        | 0.0240<br>0,610           | 5°    | 0,30<br>136 | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 37                      | 0.437<br>11,099 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 2.468<br>62,687     | 0.0240<br>0,610                        | 0.0240<br>0,610           | 4°30' | 0,33<br>150 | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 47                      | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 3.093<br>78,562     | 0.0390<br>0,990                        | 0.0390<br>0,990           | 4°30' | 0,64<br>290 | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 48                      | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 3.222<br>81,838     | 0.0390<br>0,990                        | 0.0390<br>0,990           | 4°    | 0,69<br>313 | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 49                      | 0.531<br>13,487 | 0/–0.005<br>0/–0,127 | 0/–0.0025<br>0/–0,0635 | 3.222<br>81,838     | 0.0390<br>0,990                        | 0.0390<br>0,990           | 4°    | 0,69<br>313 | 0.0010<br>0,0254    | 0.0008<br>0,0203       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |



## Designation system

Examples: ZWMKP16BSSK2CP55RP01  
KP29BSP

ZW M KP 16 BS SK2 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances and radial clearance

**No code** Standard clearance and tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                          | Lubricant | Version  |
|--------------------------|-----------|----------|
| <b>SK2</b>               | G354      | Sealed   |
| <b>S281</b>              | G395      | Sealed   |
| <b>PG81<sup>1)</sup></b> | G395      | Shielded |
| <b>P<sup>1)</sup></b>    | G354      | Shielded |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code | Tolerances       |                     |                  |                     | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup>       |                | Radial clearance                 |                                  | Maximum starting torque <sup>5)</sup> |              |
|-------------------|------------------|---------------------|------------------|---------------------|-----------------------|----------------------|--------------------------------------------------|----------------|----------------------------------|----------------------------------|---------------------------------------|--------------|
|                   | Sia max Standard | SKF super precision | Sea max Standard | SKF super precision | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring inner ring |                | Standard                         | Reduced                          | Shielded                              | Sealed       |
| –                 | in/mm            |                     |                  |                     | lbf/kN                |                      |                                                  |                | in/mm                            |                                  | oz-in/mNm                             |              |
| <b>33</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 14 400<br>64,05       | 2 900<br>12,90       | 4 820<br>21,44                                   | 4 630<br>20,60 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 9.33<br>65,89                         | 14<br>98,84  |
| <b>37</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 15 800<br>70,28       | 3 200<br>14,23       | 4 880<br>21,71                                   | 4 690<br>20,86 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 11.33<br>80,01                        | 20<br>141,23 |
| <b>47</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 24 700<br>109,87      | 5 000<br>22,24       | 6 600<br>29,36                                   | 6 390<br>28,42 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 16<br>112,96                          | 30<br>211,85 |
| <b>48</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 27 500<br>122,33      | 5 500<br>24,47       | 8 150<br>36,25                                   | 7 840<br>34,87 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 16.67<br>117,67                       | 30<br>211,85 |
| <b>49</b>         | 0.0010<br>0,0254 | 0.0008<br>0,0203    | 0.0016<br>0,0406 | 0.0010<br>0,0254    | 27 500<br>122,33      | 5 500<br>24,47       | 8 150<br>36,25                                   | 7 840<br>34,87 | 0.0003/ 0.0010<br>0,0076/ 0,0254 | 0.0001/ 0.0005<br>0,0025/ 0,0127 | 17.33<br>122,37                       | 32<br>225,97 |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

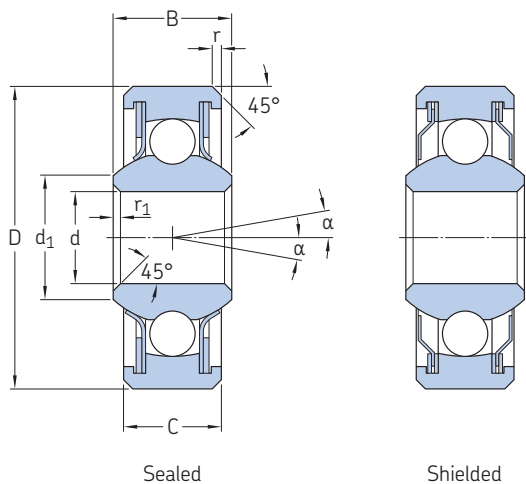
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.23 Self-aligning ball bearing single row (inch dimensions)

KSP., KSP..A, KSP..L bore code 3L to 5

Technical specification AS 7949  
Product standard AS 27645



### Dimensions

| Nominal bore code | Dimensions      | $\Delta$ dmp Standard  | SKF super precision    | $\Delta$ ds                        | D                | $\Delta$ Dmp Standard  | SKF super precision    | $\Delta$ Ds                        | C              | $\Delta$ Cs Standard | SKF super precision  |
|-------------------|-----------------|------------------------|------------------------|------------------------------------|------------------|------------------------|------------------------|------------------------------------|----------------|----------------------|----------------------|
| –                 | in/mm           |                        |                        |                                    |                  |                        |                        |                                    |                |                      |                      |
| 3L                | 0.1900<br>4,826 | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.6250<br>15,875 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.203<br>5,156 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| 3                 | 0.1900<br>4,826 | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.7774<br>19,746 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.270<br>6,858 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| 4A                | 0.2500<br>6,350 | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.7500<br>19,050 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.219<br>5,562 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| 4                 | 0.2500<br>6,350 | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.9014<br>22,896 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.335<br>8,509 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| 5A                | 0.3125<br>7,938 | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.8125<br>20,638 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.234<br>5,944 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |
| 5                 | 0.3125<br>7,938 | 0/-0.0005<br>0/-0,0127 | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 1.2500<br>31,750 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.375<br>9,525 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127 |

### Dimensions cont. and tolerances

| Nominal bore code | Dimensions      | $\Delta$ Bs Standard | SKF super precision    | $d_1$           | $r_1$                | $r$                  | $\alpha$ | Mass       | Tolerances       | Kea max          | Kea max          | SKF super precision |
|-------------------|-----------------|----------------------|------------------------|-----------------|----------------------|----------------------|----------|------------|------------------|------------------|------------------|---------------------|
| –                 | in/mm           |                      |                        |                 | +0.015/0<br>+0,381/0 | +0.015/0<br>+0,381/0 | °        | lb/g       | in/mm            | Standard         | Standard         | SKF super precision |
| 3L                | 0.245<br>6,223  | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.256<br>6,502  | 0.005<br>0,127       | 0.016<br>0,406       | 10       | 0,01<br>5  | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406 | 0.0008<br>0,0203    |
| 3                 | 0.297<br>7,544  | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.297<br>7,544  | 0.005<br>0,127       | 0.022<br>0,559       | 10       | 0.03<br>14 | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406 | 0.0008<br>0,0203    |
| 4A                | 0.281<br>7,137  | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.328<br>8,331  | 0.005<br>0,127       | 0.016<br>0,406       | 8        | 0,02<br>9  | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406 | 0.0008<br>0,0203    |
| 4                 | 0.484<br>12,294 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.396<br>10,058 | 0.005<br>0,127       | 0.032<br>0,813       | 10       | 0.04<br>18 | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406 | 0.0008<br>0,0203    |
| 5A                | 0.297<br>7,544  | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.389<br>9,880  | 0.015<br>0,381       | 0.016<br>0,406       | 8        | 0,02<br>9  | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406 | 0.0008<br>0,0203    |
| 5                 | 0.558<br>14,173 | 0/-0.005<br>0/-0,127 | 0/-0.0025<br>0/-0,0635 | 0.567<br>14,402 | 0.015<br>0,381       | 0.032<br>0,813       | 10       | 0.10<br>45 | 0.0010<br>0,0254 | 0.0005<br>0,0127 | 0.0016<br>0,0406 | 0.0008<br>0,0203    |





## Designation system

Examples: ZWMKSP 6ASK1CP55RP01  
KSP 3P

ZW M KSP 6 A SK1 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances

**No code** Standard tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                            | Lubricant | Shield and seal | Radial clearance<br>KSP.. | MKSP.. <sup>1)</sup> |
|----------------------------|-----------|-----------------|---------------------------|----------------------|
| <b>SK1</b>                 | G354      | Sealed          | Standard                  | Reduced              |
| <b>S181</b>                | G395      | Sealed          | Standard                  | Reduced              |
| <b>S181-R</b>              | G395      | Sealed          | Reduced                   | –                    |
| <b>SK1-R</b>               | G354      | Sealed          | Reduced                   | –                    |
| <b>P<sup>1)</sup></b>      | G354      | Shielded        | Standard                  | Reduced              |
| <b>PG81<sup>1)</sup></b>   | G395      | Shielded        | Standard                  | Reduced              |
| <b>PG81-R<sup>1)</sup></b> | G395      | Shielded        | Reduced                   | –                    |
| <b>P-R<sup>1)</sup></b>    | G354      | Shielded        | Reduced                   | –                    |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Loads, clearance and torque

| Nominal bore code | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup>       |               | Radial clearance       |                                  | Axial clearance max | Maximum starting torque <sup>5)</sup> |            |
|-------------------|-----------------------|----------------------|--------------------------------------------------|---------------|------------------------|----------------------------------|---------------------|---------------------------------------|------------|
|                   | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring inner ring |               | Standard               | Reduced                          |                     | Shielded                              | Sealed     |
| –                 | lbf/kN                |                      | lbf/kN                                           |               | in/mm                  |                                  |                     | oz-in/mNm                             |            |
| <b>3L</b>         | 550<br>2,45           | 100<br>0,45          | 550<br>2,45                                      | 480<br>2,14   | 0/ 0,0010<br>0/ 0,0254 | 0,0001/ 0,0005<br>0,0025/ 0,0127 | 0,023<br>0,584      | 0,67<br>4,71                          | 1<br>7,06  |
| <b>3</b>          | 900<br>4,00           | 200<br>0,89          | 900<br>4,00                                      | 770<br>3,43   | 0/ 0,0010<br>0/ 0,0254 | 0,0001/ 0,0005<br>0,0025/ 0,0127 | 0,023<br>0,584      | 0,67<br>4,71                          | 1<br>7,06  |
| <b>4A</b>         | 900<br>4,00           | 200<br>0,89          | 900<br>4,00                                      | 770<br>3,43   | 0/ 0,0010<br>0/ 0,0254 | 0,0001/ 0,0005<br>0,0025/ 0,0127 | 0,025<br>0,635      | 0,67<br>4,71                          | 1<br>7,06  |
| <b>4</b>          | 1 410<br>6,27         | 300<br>1,33          | 1 230<br>5,47                                    | 1 230<br>5,47 | 0/ 0,0010<br>0/ 0,0254 | 0,0001/ 0,0005<br>0,0025/ 0,0127 | 0,025<br>0,635      | 0,67<br>4,71                          | 1<br>7,06  |
| <b>5A</b>         | 1 000<br>4,45         | 200<br>0,89          | 950<br>4,23                                      | 815<br>3,63   | 0/ 0,0010<br>0/ 0,0254 | 0,0001/ 0,0005<br>0,0025/ 0,0127 | 0,028<br>0,711      | 1,33<br>9,41                          | 2<br>14,12 |
| <b>5</b>          | 2 190<br>9,74         | 300<br>1,33          | 2 190<br>9,74                                    | 1 890<br>8,41 | 0/ 0,0010<br>0/ 0,0254 | 0,0001/ 0,0005<br>0,0025/ 0,0127 | 0,028<br>0,711      | 1,33<br>9,41                          | 2<br>14,12 |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

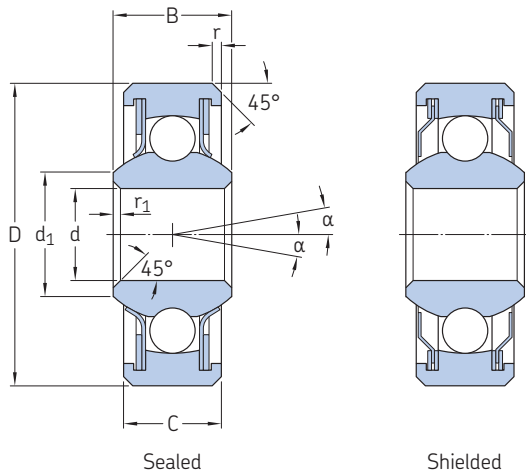
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher.

### 1.23 Self-aligning ball bearing single row (inch dimensions)

KSP., KSP..A, KSP..L bore code **6A to 10**

|                         |          |
|-------------------------|----------|
| Technical specification | AS 7949  |
| Product standard        | AS 27645 |



#### Dimensions

| Nominal<br>bore<br>code | Dimensions       |                          |                        | $\Delta$ ds                        | D                | $\Delta$ Dmp           |                        | $\Delta$ Ds                        | C               | $\Delta$ Cs          |                        |
|-------------------------|------------------|--------------------------|------------------------|------------------------------------|------------------|------------------------|------------------------|------------------------------------|-----------------|----------------------|------------------------|
|                         | d                | $\Delta$ dmp<br>Standard | SKF super<br>precision |                                    |                  | Standard               | SKF super<br>precision |                                    |                 | Standard             | SKF super<br>precision |
| –                       | in/mm            |                          |                        |                                    |                  |                        |                        |                                    |                 |                      |                        |
| 6A                      | 0.3750<br>9,525  | 0/-0.0005<br>0/-0,0127   | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 0.8750<br>22,225 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.250<br>6,350  | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127   |
| 6                       | 0.3750<br>9,525  | 0/-0.0005<br>0/-0,0127   | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 1.4375<br>36,513 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.469<br>11,913 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127   |
| 8                       | 0.5000<br>12,700 | 0/-0.0005<br>0/-0,0127   | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 1.6875<br>42,862 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.500<br>12,700 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127   |
| 10                      | 0.6250<br>15,875 | 0/-0.0005<br>0/-0,0127   | 0/-0.0003<br>0/-0,0076 | +0.0002/-0.0007<br>+0,0050/-0,0178 | 1.9375<br>49,212 | 0/-0.0005<br>0/-0,0127 | 0/-0.0004<br>0/-0,0101 | +0.0005/-0.0010<br>+0,0127/-0,0254 | 0.625<br>15,875 | 0/-0.005<br>0/-0,127 | 0/-0.005<br>0/-0,127   |

#### Dimensions cont. and tolerances

| Nominal<br>bore<br>code | Dimensions      |                       | SKF super<br>precision  | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0.015/0<br>+0,381/0 | r<br>+0.015/0<br>+0,381/0 | α  | Mass<br>≈   | Tolerances          |                        |                     |                        |
|-------------------------|-----------------|-----------------------|-------------------------|---------------------|----------------------------------------|---------------------------|----|-------------|---------------------|------------------------|---------------------|------------------------|
|                         | B               | ΔBs<br>Standard       |                         |                     |                                        |                           |    |             | Kia max<br>Standard | SKF super<br>precision | Kea max<br>Standard | SKF super<br>precision |
| –                       | in/mm           |                       |                         |                     |                                        |                           | °  | lb/g        | in/mm               |                        |                     |                        |
| 6A                      | 0.313<br>7,950  | 0/−0.005<br>0/−0,0127 | 0/−0.0025<br>0/−0,00635 | 0.462<br>11,735     | 0.016<br>0,406                         | 0.016<br>0,406            | 8  | 0,03<br>14  | 0.0010<br>0,0254    | 0.0005<br>0,0127       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 6                       | 0.620<br>15,748 | 0/−0.005<br>0/−0,0127 | 0/−0.0025<br>0/−0,00635 | 0.612<br>15,545     | 0.015<br>0,381                         | 0.032<br>0,813            | 10 | 0.15<br>68  | 0.0010<br>0,0254    | 0.0005<br>0,0127       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 8                       | 0.620<br>15,748 | 0/−0.005<br>0/−0,0127 | 0/−0.0025<br>0/−0,00635 | 0.796<br>20,218     | 0.015<br>0,381                         | 0.044<br>1,118            | 10 | 0.23<br>104 | 0.0010<br>0,0254    | 0.0005<br>0,0127       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |
| 10                      | 0.813<br>20,650 | 0/−0.005<br>0/−0,0127 | 0/−0.0025<br>0/−0,00635 | 0.922<br>23,418     | 0.015<br>0,381                         | 0.044<br>1,118            | 10 | 0.37<br>168 | 0.0010<br>0,0254    | 0.0005<br>0,0127       | 0.0016<br>0,0406    | 0.0008<br>0,0203       |

## Designation system

Examples: ZWMKSP 6ASK1CP55RP01  
 KSP 3P

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances

**No code** Standard tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                            | Lubricant | Shield and seal | Radial clearance<br>KSP.. | MKSP.. <sup>1)</sup> |
|----------------------------|-----------|-----------------|---------------------------|----------------------|
| <b>SK1</b>                 | G354      | Sealed          | Standard                  | Reduced              |
| <b>S181</b>                | G395      | Sealed          | Standard                  | Reduced              |
| <b>S181-R</b>              | G395      | Sealed          | Reduced                   | –                    |
| <b>SK1-R</b>               | G354      | Sealed          | Reduced                   | –                    |
| <b>P<sup>1)</sup></b>      | G354      | Shielded        | Standard                  | Reduced              |
| <b>PG81<sup>1)</sup></b>   | G395      | Shielded        | Standard                  | Reduced              |
| <b>PG81-R<sup>1)</sup></b> | G395      | Shielded        | Reduced                   | –                    |
| <b>P-R<sup>1)</sup></b>    | G354      | Shielded        | Reduced                   | –                    |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, available only for corrosion-resistant steel material without other surface treatment

## Loads, clearance and torque

| Nominal bore code | Static limit loads    |                      | Radial dynamic load rating <sup>3)4)</sup>       |       | Radial clearance |                | Axial clearance max | Maximum starting torque <sup>5)</sup> |        |
|-------------------|-----------------------|----------------------|--------------------------------------------------|-------|------------------|----------------|---------------------|---------------------------------------|--------|
|                   | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Load fixed with respect to outer ring inner ring |       | Standard         | Reduced        |                     | Shielded                              | Sealed |
| –                 | lbf/kN                |                      |                                                  |       | in/mm            |                |                     | oz-in/mNm                             |        |
| <b>6A</b>         | 1 120                 | 200                  | 1 120                                            | 990   | 0/ 0.0010        | 0.0001/ 0.0005 | 0,03                | 2                                     | 3      |
|                   | 4,98                  | 0,89                 | 4,98                                             | 4,40  | 0/ 0,0254        | 0,0025/ 0,0127 | 0,762               | 14.12                                 | 21.18  |
| <b>6</b>          | 2 980                 | 400                  | 2 980                                            | 2 580 | 0/ 0.0010        | 0.0001/ 0.0005 | 0,03                | 2                                     | 3      |
|                   | 13,26                 | 1,78                 | 13,26                                            | 11,48 | 0/ 0,0254        | 0,0025/ 0,0127 | 0,762               | 14.12                                 | 21.18  |
| <b>8</b>          | 3 670                 | 500                  | 3 670                                            | 3 290 | 0/ 0.0010        | 0.0001/ 0.0005 | 0.032               | 2.67                                  | 4      |
|                   | 16,32                 | 2,22                 | 16,32                                            | 14,63 | 0/ 0,0254        | 0,0025/ 0,0127 | 0,813               | 18.83                                 | 28.25  |
| <b>10</b>         | 5 320                 | 600                  | 4 980                                            | 4 360 | 0/ 0.0010        | 0.0001/ 0.0005 | 0.034               | 4                                     | 5      |
|                   | 23,66                 | 2,67                 | 22,15                                            | 19,39 | 0/ 0,0254        | 0,0025/ 0,0127 | 0,864               | 28.25                                 | 35,31  |

<sup>3)</sup> For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

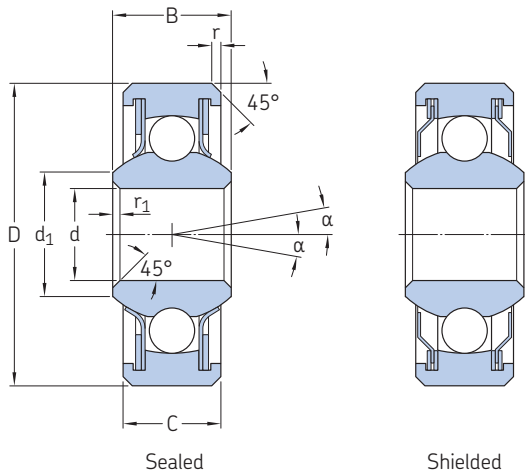
<sup>4)</sup> If G395 load rating is 20% lower

<sup>5)</sup> Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.24 Self-aligning ball bearing single row (inch dimensions)

KSP..SP., KSP.A..SP..

Technical specification –  
Product standard –



### Dimensions, loads and clearance

| Nominal bore code | Dimensions<br>d<br>+0.0002/-0.0003<br>+0.005/-0.008 | D<br>+0/-0.0005<br>+0/-0.013 | C<br>0/-0.005<br>0/-0.127 | B<br>0/-0.005<br>0/-0.127 | d <sub>1</sub><br>≈ | r <sub>1</sub><br>Min | r<br>Min       | α  | Mass<br>≈    | Static limit load<br>Radial<br>C <sub>s</sub> | Radial clearance     |
|-------------------|-----------------------------------------------------|------------------------------|---------------------------|---------------------------|---------------------|-----------------------|----------------|----|--------------|-----------------------------------------------|----------------------|
| –                 | in/mm                                               |                              |                           |                           |                     |                       |                | °  | lb/g         | lbf/kN                                        | in/mm                |
| <b>3..SP2</b>     | 0.1898<br>4,821                                     | 0.7774<br>19,746             | 0.2700<br>6,858           | 0.2970<br>7,544           | 0.328<br>8,331      | 0.030<br>0,762        | 0.030<br>0,762 | 12 | 0.026<br>12  | 890<br>3,96                                   | 0/0.0005<br>0/0.0127 |
| <b>3A..SP3</b>    | 0.1898<br>4,821                                     | 0.6250<br>15,875             | 0.2030<br>5,156           | 0.2450<br>6,223           | 0.257<br>6,528      | 0.015<br>0,381        | 0.015<br>0,381 | 10 | 0.011<br>5   | 540<br>2,40                                   | 0/0.0005<br>0/0.0127 |
| <b>3..SP4</b>     | 0.1898<br>4,821                                     | 0.7774<br>19,746             | 0.2700<br>6,858           | 0.3750<br>9,525           | 0.298<br>7,569      | 0.005<br>0,127        | 0.022<br>0,559 | 7  | 0.026<br>12  | 890<br>3,96                                   | 0/0.0005<br>0/0.0127 |
| <b>4..SP1</b>     | 0.2500<br>6,350                                     | 0.9014<br>22,896             | 0.3350<br>8,509           | 0.4840<br>12,294          | 0.410<br>10,414     | 0.040<br>1,016        | 0.040<br>1,016 | 12 | 0.042<br>19  | 1 390<br>6,18                                 | 0/0.0005<br>0/0.0127 |
| <b>5..SP3</b>     | 0.3125<br>7,938                                     | 1.2500<br>31,750             | 0.3750<br>9,525           | 0.5575<br>14,160          | 0.563<br>14,300     | 0.040<br>1,016        | 0.040<br>1,016 | 10 | 0.104<br>47  | 2 170<br>9,65                                 | 0/0.0005<br>0/0.0127 |
| <b>5A..SP4</b>    | 0.3125<br>7,938                                     | 0.8750<br>22,225             | 0.3125<br>7,938           | 0.6250<br>15,875          | 0.415<br>10,541     | 0.016<br>0,406        | 0.016<br>0,406 | 10 | 0.037<br>17  | 1 270<br>5,65                                 | 0/0.0005<br>0/0.0127 |
| <b>5A..SP5</b>    | 0.3125<br>7,938                                     | 0.8750<br>22,225             | 0.3125<br>7,937           | 0.5200<br>13,208          | 0.415<br>10,541     | 0.016<br>0,406        | 0.016<br>0,406 | 10 | 0.035<br>16  | 1 270<br>5,65                                 | 0/0.0005<br>0/0.0127 |
| <b>6..SP1</b>     | 0.3750<br>9,525                                     | 1.4375<br>36,513             | 0.4688<br>11,907          | 0.6200<br>15,748          | 0.688<br>17,475     | 0.040<br>1,016        | 0.040<br>1,016 | 10 | 0.156<br>71  | 3 550<br>15,79                                | 0/0.0005<br>0/0.0127 |
| <b>6A..SP2</b>    | 0.3748<br>9,520                                     | 0.8750<br>22,225             | 0.2500<br>6,350           | 0.3130<br>7,950           | 0.475<br>12,065     | 0.025<br>0,635        | 0.025<br>0,635 | 9  | 0.03<br>14   | 1 110<br>4,94                                 | 0/0.0007<br>0/0.0178 |
| <b>8..SP1</b>     | 0.5000<br>12,700                                    | 1.6875<br>42,862             | 0.5000<br>12,700          | 0.6200<br>15,748          | 0.854<br>21,692     | 0.047<br>1,194        | 0.047<br>1,194 | 10 | 0.236<br>107 | 4 150<br>18,46                                | 0/0.0007<br>0/0.0178 |
| <b>10..SP1</b>    | 0.6250<br>15,875                                    | 1.9375<br>49,212             | 0.6250<br>15,875          | 0.8125<br>20,638          | 1.000<br>25,400     | 0.047<br>1,194        | 0.047<br>1,194 | 12 | 0.379<br>172 | 5 620<br>25,00                                | 0/0.0007<br>0/0.0178 |

## Designation system

Examples: ZWKSP 6APSP2G81CP55RP01 ZW KSP 6 A P SP2 G81 CP55 RP01  
KSP10SP1

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW** Cadmium plated corrosion-resistant steel  
**SZW** Zinc-nickel plated corrosion-resistant steel

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Shield and seal

**No code** Sealed  
**P** Shielded

### Lubricant

**No code** Grease G354  
**G81** Grease G395

### Passivation

**No code** Not treated  
**CP55<sup>1)</sup>** Passivated corrosion-resistant steel

### Oversize

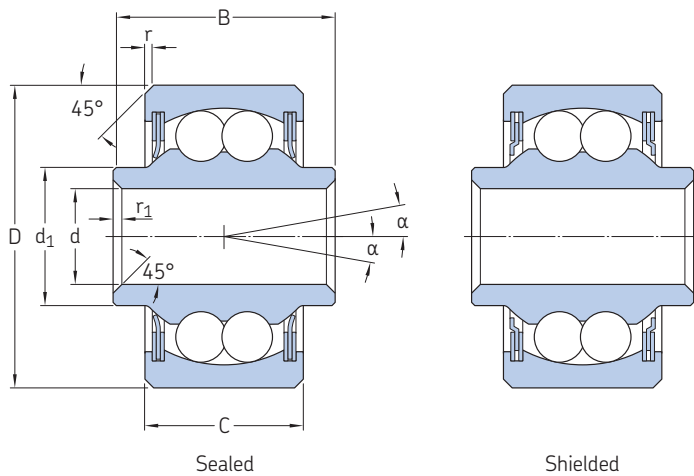
**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> Available only for corrosion-resistant steel material without other surface treatment

## 1.25 Self-aligning ball bearing double row (inch dimensions)

KN..

Technical specification –  
Product standard –



1.25

### Dimensions

#### Nominal Dimensions

| bore code    | d                | $\Delta d_{mp}$        | D                | $\Delta D_{mp}$         | C               | $\Delta C_s$           | B               | $\Delta B_s$           | $d_1 \approx$   | $r_1$<br>+0.012/-0.004<br>+0.300/-0.100 | r<br>+0.012/-0.004<br>+0.300/-0.100 | $\alpha$ |
|--------------|------------------|------------------------|------------------|-------------------------|-----------------|------------------------|-----------------|------------------------|-----------------|-----------------------------------------|-------------------------------------|----------|
| –            | in/mm            |                        |                  |                         |                 |                        |                 |                        |                 |                                         |                                     | °        |
| <b>4,83</b>  | 0.1900<br>4,826  | 0/-0.0005<br>0/-0.0127 | 0.6300<br>16,000 | 0/-0.0003<br>0/-0.0080  | 0.315<br>8,000  | 0/-0.0039<br>0/-0.1000 | 0.472<br>12,000 | 0/-0.0039<br>0/-0.1000 | 0.299<br>7,595  | 0.020<br>0,500                          | 0.020<br>0,500                      | 7        |
| <b>6,35</b>  | 0.2500<br>6,350  | 0/-0.0005<br>0/-0.0127 | 0.7480<br>19,000 | 0/-0.00035<br>0/-0.0090 | 0.394<br>10,000 | 0/-0.0039<br>0/-0.1000 | 0.551<br>14,000 | 0/-0.0039<br>0/-0.1000 | 0.323<br>8,204  | 0.020<br>0,500                          | 0.020<br>0,500                      | 7        |
| <b>7,94</b>  | 0.3125<br>7,938  | 0/-0.0005<br>0/-0.0127 | 0.9449<br>24,000 | 0/-0.00035<br>0/-0.0090 | 0.394<br>10,000 | 0/-0.0039<br>0/-0.1000 | 0.591<br>15,000 | 0/-0.0039<br>0/-0.1000 | 0.437<br>11,100 | 0.020<br>0,500                          | 0.020<br>0,500                      | 7        |
| <b>9,52</b>  | 0.3750<br>9,525  | 0/-0.0005<br>0/-0.0127 | 1.1811<br>30,000 | 0/-0.00035<br>0/-0.0090 | 0.551<br>14,000 | 0/-0.0039<br>0/-0.1000 | 0.787<br>20,000 | 0/-0.0039<br>0/-0.1000 | 0.535<br>13,589 | 0.020<br>0,500                          | 0.020<br>0,500                      | 7        |
| <b>12,7</b>  | 0.5000<br>12,700 | 0/-0.0005<br>0/-0.0127 | 1.2598<br>32,000 | 0/-0.00043<br>0/-0.0110 | 0.551<br>14,000 | 0/-0.0039<br>0/-0.1000 | 0.787<br>20,000 | 0/-0.0039<br>0/-0.1000 | 0.606<br>15,392 | 0.020<br>0,500                          | 0.020<br>0,500                      | 7        |
| <b>15,87</b> | 0.6250<br>15,875 | 0/-0.0005<br>0/-0.0127 | 1.3780<br>35,000 | 0/-0.00043<br>0/-0.0110 | 0.551<br>14,000 | 0/-0.0039<br>0/-0.1000 | 0.787<br>20,000 | 0/-0.0039<br>0/-0.1000 | 0.728<br>18,491 | 0.020<br>0,500                          | 0.020<br>0,500                      | 7        |

### Tolerances, loads, clearance and torque

| Nominal bore code | Mass $\approx$ | Tolerances<br>Kia max | Kea max         | Static limit loads<br>Radial<br>$C_s$ | Axial<br>$C_a$ | Clearances<br>Axial<br>Max | Radial<br>Max     | Maximum starting torque<br>Shielded | Sealed         | Max. swivelling torque |
|-------------------|----------------|-----------------------|-----------------|---------------------------------------|----------------|----------------------------|-------------------|-------------------------------------|----------------|------------------------|
| –                 | lb/g           | in/mm                 |                 | lbf/kN                                |                | in/mm                      |                   | oz-in/mNm                           |                |                        |
| <b>4,83</b>       | 0.020<br>9     | 0.0010<br>0,025       | 0.0016<br>0,040 | 877<br>3,90                           | 270<br>1,20    | 0.0028<br>0,0700           | 0.00024<br>0,0060 | 0.566<br>4,00                       | 1.133<br>8,00  | 14.2<br>0,10           |
| <b>6,35</b>       | 0.031<br>14    | 0.0010<br>0,025       | 0.0016<br>0,040 | 1 326<br>5,90                         | 405<br>1,80    | 0.0028<br>0,0700           | 0.00024<br>0,0060 | 0.637<br>4,50                       | 1.274<br>9,00  | 14.2<br>0,10           |
| <b>7,94</b>       | 0.066<br>30    | 0.0010<br>0,025       | 0.0016<br>0,040 | 2 203<br>9,80                         | 674<br>3,00    | 0.0031<br>0,0800           | 0.00028<br>0,0070 | 0.779<br>5,50                       | 1.416<br>10,00 | 14.2<br>0,10           |
| <b>9,52</b>       | 0.126<br>57    | 0.0010<br>0,025       | 0.0016<br>0,040 | 3 192<br>14,20                        | 1 012<br>4,50  | 0.0031<br>0,0800           | 0.00028<br>0,0070 | 1.062<br>7,50                       | 1.699<br>12,00 | 14.2<br>0,10           |
| <b>12,7</b>       | 0.137<br>62    | 0.0010<br>0,025       | 0.0016<br>0,040 | 3 754<br>16,70                        | 1 169<br>5,20  | 0.0031<br>0,0800           | 0.00035<br>0,0090 | 1.274<br>9,00                       | 1.983<br>14,00 | 14.2<br>0,10           |
| <b>15,87</b>      | 0.165<br>75    | 0.0010<br>0,025       | 0.0016<br>0,040 | 4 272<br>19,00                        | 1 326<br>5,90  | 0.0031<br>0,0800           | 0.00035<br>0,0090 | 1.699<br>12,00                      | 2.549<br>18,00 | 14.2<br>0,10           |

## Designation system

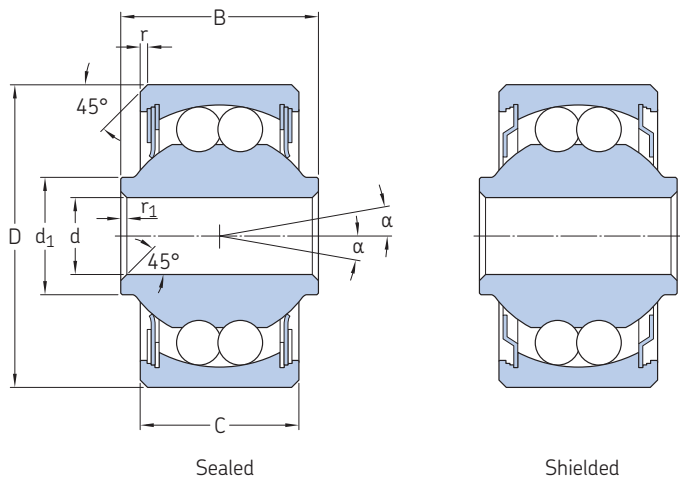
|                                                         |                                            |   |   |    |      |     |      |      |
|---------------------------------------------------------|--------------------------------------------|---|---|----|------|-----|------|------|
| Examples:                                               | ZWKN 6,35SK1CP55RP01<br>KN12,7             | Z | W | KN | 6,35 | SK1 | CP55 | RP01 |
| <b>Surface treatment</b>                                |                                            |   |   |    |      |     |      |      |
| <b>No code</b>                                          | Not plated steel                           |   |   |    |      |     |      |      |
| <b>Z</b>                                                | Cadmium plated steel                       |   |   |    |      |     |      |      |
| <b>SZ</b>                                               | Zinc-nickel plated steel                   |   |   |    |      |     |      |      |
| <b>Material</b>                                         |                                            |   |   |    |      |     |      |      |
| <b>No code</b>                                          | Bearing steel                              |   |   |    |      |     |      |      |
| <b>W</b>                                                | Corrosion-resistant steel                  |   |   |    |      |     |      |      |
| <b>Basic designation</b>                                |                                            |   |   |    |      |     |      |      |
| <b>Bore code</b> (multiples of 1/16 <sup>th</sup> inch) |                                            |   |   |    |      |     |      |      |
| <b>Variation</b>                                        |                                            |   |   |    |      |     |      |      |
|                                                         | <b>Lubricant</b>                           |   |   |    |      |     |      |      |
| <b>No code</b>                                          | G354                                       |   |   |    |      |     |      |      |
| <b>G81</b>                                              | G395                                       |   |   |    |      |     |      |      |
| <b>S181</b>                                             | G395                                       |   |   |    |      |     |      |      |
| <b>SK1</b>                                              | G354                                       |   |   |    |      |     |      |      |
|                                                         | <b>Version</b>                             |   |   |    |      |     |      |      |
|                                                         | Shielded                                   |   |   |    |      |     |      |      |
|                                                         | Shielded                                   |   |   |    |      |     |      |      |
|                                                         | Sealed                                     |   |   |    |      |     |      |      |
|                                                         | Sealed                                     |   |   |    |      |     |      |      |
| <b>Passivation</b>                                      |                                            |   |   |    |      |     |      |      |
| <b>No code</b>                                          | Not treated                                |   |   |    |      |     |      |      |
| <b>CP55<sup>1)</sup></b>                                | Passivated corrosion-resistant steel       |   |   |    |      |     |      |      |
| <b>Oversize</b>                                         |                                            |   |   |    |      |     |      |      |
| <b>No code</b>                                          | Standard outer diameter size               |   |   |    |      |     |      |      |
| <b>RP01</b>                                             | 0.010 in/0,254 mm oversized outer diameter |   |   |    |      |     |      |      |
| <b>RP02</b>                                             | 0.020 in/0,508 mm oversized outer diameter |   |   |    |      |     |      |      |

<sup>1)</sup> Available only for corrosion-resistant steel material without other surface treatment

## 1.26 Self-aligning ball bearing double row (inch dimensions)

DSP..

Technical specification AS 7949  
Product standard AS 27643



### Dimensions

| Nominal<br>bore<br>code | Dimensions |                  |                        | D               | ΔDmp<br>Standard | SKF super<br>precision | ΔDs       | C               | ΔCs<br>Standard | SKF super<br>precision |          |
|-------------------------|------------|------------------|------------------------|-----------------|------------------|------------------------|-----------|-----------------|-----------------|------------------------|----------|
|                         | d          | Δdmp<br>Standard | SKF super<br>precision |                 |                  |                        |           |                 |                 |                        |          |
| –                       | in/mm      |                  |                        |                 |                  |                        |           |                 |                 |                        |          |
| 3                       | 0.1900     | 0/–0.0005        | 0/–0.0003              | +0.0002/–0.0007 | 0.7774           | 0/–0.0005              | 0/–0.0004 | +0.0005/–0.0010 | 0.392           | 0/–0.005               | 0/–0.005 |
|                         | 4,826      | 0/–0,0127        | 0/–0,0076              | +0,0050/–0,0178 | 19,745           | 0/–0,0127              | 0/–0,0101 | +0,0127/–0,0254 | 9,957           | 0/–0,127               | 0/–0,127 |
| 4                       | 0.2500     | 0/–0.0005        | 0/–0.0003              | +0.0002/–0.0007 | 0.9014           | 0/–0.0005              | 0/–0.0004 | +0.0005/–0.0010 | 0.464           | 0/–0.005               | 0/–0.005 |
|                         | 6,350      | 0/–0,0127        | 0/–0,0076              | +0,0050/–0,0178 | 22,895           | 0/–0,0127              | 0/–0,0101 | +0,0127/–0,0254 | 11,785          | 0/–0,127               | 0/–0,127 |
| 5                       | 0.3125     | 0/–0.0005        | 0/–0.0003              | +0.0002/–0.0007 | 1.2500           | 0/–0.0005              | 0/–0.0004 | +0.0005/–0.0010 | 0.656           | 0/–0.005               | 0/–0.005 |
|                         | 7,938      | 0/–0,0127        | 0/–0,0076              | +0,0050/–0,0178 | 31,750           | 0/–0,0127              | 0/–0,0101 | +0,0127/–0,0254 | 16,662          | 0/–0,127               | 0/–0,127 |
| 6                       | 0.3750     | 0/–0.0005        | 0/–0.0003              | +0.0002/–0.0007 | 1.4375           | 0/–0.0005              | 0/–0.0004 | +0.0005/–0.0010 | 0.750           | 0/–0.005               | 0/–0.005 |
|                         | 9,525      | 0/–0,0127        | 0/–0,0076              | +0,0050/–0,0178 | 36,513           | 0/–0,0127              | 0/–0,0101 | +0,0127/–0,0254 | 19,050          | 0/–0,127               | 0/–0,127 |
| 8                       | 0.5000     | 0/–0.0005        | 0/–0.0003              | +0.0002/–0.0007 | 1.6875           | 0/–0.0005              | 0/–0.0004 | +0.0005/–0.0010 | 0.812           | 0/–0.005               | 0/–0.005 |
|                         | 12,700     | 0/–0,0127        | 0/–0,0076              | +0,0050/–0,0178 | 42,862           | 0/–0,0127              | 0/–0,0101 | +0,0127/–0,0254 | 20,624          | 0/–0,127               | 0/–0,127 |
| 10                      | 0.6250     | 0/–0.0005        | 0/–0.0003              | +0.0002/–0.0007 | 1.9375           | 0/–0.0005              | 0/–0.0004 | +0.0005/–0.0010 | 0.937           | 0/–0.005               | 0/–0.005 |
|                         | 15,875     | 0/–0,0127        | 0/–0,0076              | +0,0050/–0,0178 | 49,212           | 0/–0,0127              | 0/–0,0101 | +0,0127/–0,0254 | 23,799          | 0/–0,127               | 0/–0,127 |

### Dimensions cont. and tolerances

| Nominal<br>bore<br>code | Dimensions |                 | SKF super<br>precision | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0.015/0<br>+0,381/0 | r<br>+0.015/0<br>+0,381/0 | α  | Mass<br>≈ | Tolerances          |        | Kea max<br>Standard | SKF super<br>precision |
|-------------------------|------------|-----------------|------------------------|---------------------|----------------------------------------|---------------------------|----|-----------|---------------------|--------|---------------------|------------------------|
|                         | B          | ΔBs<br>Standard |                        |                     |                                        |                           |    |           | Kia max<br>Standard |        |                     |                        |
| –                       | in/mm      |                 |                        |                     |                                        |                           | °  | lb/g      | in/mm               |        |                     |                        |
| 3                       | 0.500      | 0/–0.005        | 0/–0.0025              | 0.304               | 0.005                                  | 0.022                     | 10 | 0,04      | 0.0010              | 0.0005 | 0.0016              | 0.0008                 |
|                         | 12,700     | 0/–0.127        | 0/–0.0635              | 7,721               | 0.127                                  | 0.559                     |    | 18        | 0,0254              | 0,0127 | 0,0406              | 0,0203                 |
| 4                       | 0.687      | 0/–0.005        | 0/–0.0025              | 0.430               | 0.005                                  | 0.032                     | 10 | 0,06      | 0.0010              | 0.0005 | 0.0016              | 0.0008                 |
|                         | 17,449     | 0/–0.127        | 0/–0.0635              | 10,922              | 0.127                                  | 0,813                     |    | 27        | 0,0254              | 0,0127 | 0,0406              | 0,0203                 |
| 5                       | 0.812      | 0/–0.005        | 0/–0.0025              | 0.515               | 0.015                                  | 0.032                     | 10 | 0,16      | 0.0010              | 0.0005 | 0.0016              | 0.0008                 |
|                         | 20,624     | 0/–0.127        | 0/–0.0635              | 13,081              | 0,381                                  | 0,813                     |    | 73        | 0,0254              | 0,0127 | 0,0406              | 0,0203                 |
| 6                       | 0.937      | 0/–0.005        | 0/–0.0025              | 0.564               | 0.015                                  | 0.032                     | 10 | 0,24      | 0.0010              | 0.0005 | 0.0016              | 0.0008                 |
|                         | 23,799     | 0/–0.127        | 0/–0.0635              | 14,325              | 0,381                                  | 0,813                     |    | 109       | 0,0254              | 0,0127 | 0,0406              | 0,0203                 |
| 8                       | 1.000      | 0/–0.005        | 0/–0.0025              | 0.775               | 0.015                                  | 0.044                     | 10 | 0,36      | 0.0010              | 0.0005 | 0.0016              | 0.0008                 |
|                         | 25,400     | 0/–0.127        | 0/–0.0635              | 19,685              | 0,381                                  | 1.118                     |    | 163       | 0,0254              | 0,0127 | 0,0406              | 0,0203                 |
| 10                      | 1.125      | 0/–0.005        | 0/–0.0025              | 0.869               | 0.015                                  | 0.044                     | 10 | 0,53      | 0.0010              | 0.0005 | 0.0016              | 0.0008                 |
|                         | 28,575     | 0/–0.127        | 0/–0.0635              | 22,072              | 0,381                                  | 1.118                     |    | 240       | 0,0254              | 0,0127 | 0,0406              | 0,0203                 |





## Designation system

Examples: ZWMDSP10SK1CP55RP01  
DSP 4P

ZW M DSP 10 SK1 CP55 RP01

### Material and surface treatment

**No code** Cadmium plated bearing steel  
**W<sup>1)</sup>** Corrosion-resistant steel  
**S** Zinc-nickel plated bearing steel  
**ZW<sup>1)</sup>** Cadmium plated corrosion-resistant steel  
**SZW<sup>1)</sup>** Zinc-nickel plated corrosion-resistant steel

### Tolerances

**No code** Standard tolerances  
**M<sup>1)</sup>** Reduced clearance and SKF super precision

### Basic designation

**Bore code** (multiples of 1/16<sup>th</sup> inch)

### Variation

|                            | Lubricant | Version  | Radial clearance<br>DSP.. | MDSP.. <sup>1)</sup> |
|----------------------------|-----------|----------|---------------------------|----------------------|
| <b>SK1</b>                 | G354      | Sealed   | Standard                  | Reduced              |
| <b>S181</b>                | G395      | Sealed   | Standard                  | Reduced              |
| <b>S181-R</b>              | G395      | Sealed   | Reduced                   | –                    |
| <b>SK1-R</b>               | G354      | Sealed   | Reduced                   | –                    |
| <b>P<sup>1)</sup></b>      | G354      | Shielded | Standard                  | Reduced              |
| <b>PG81<sup>1)</sup></b>   | G395      | Shielded | Standard                  | Reduced              |
| <b>PG81-R<sup>1)</sup></b> | G395      | Shielded | Reduced                   | –                    |
| <b>P-R<sup>1)</sup></b>    | G354      | Shielded | Reduced                   | –                    |

### Passivation

**No code** Not treated  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

1) SKF option

2) SKF option, available only for corrosion-resistant steel material without other surface treatment

## Tolerances cont., loads, clearance and torque

| Nominal bore code | Static limit loads       |                         | Radial dynamic load rating <sup>3)4)</sup>          |                | Radial clearance       |                                  | Axial clearance max | Maximum starting torque <sup>5)</sup> |            |
|-------------------|--------------------------|-------------------------|-----------------------------------------------------|----------------|------------------------|----------------------------------|---------------------|---------------------------------------|------------|
|                   | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | Load fixed with respect to<br>outer ring inner ring |                | Standard               | Reduced                          |                     | Shielded                              | Sealed     |
| –                 | lbf/kN                   |                         | lbf/kN                                              |                | in/mm                  |                                  |                     | oz.in/mNm                             |            |
| <b>3</b>          | 1 420<br>6,32            | 200<br>0,89             | 1 420<br>6,32                                       | 1 220<br>5,43  | 0/ 0,0010<br>0/ 0,0254 | 0,0002/ 0,0005<br>0,0051/ 0,0127 | 0,0055<br>0,140     | 0,67<br>4,71                          | 1<br>7,06  |
| <b>4</b>          | 1 780<br>7,92            | 300<br>1,33             | 1 780<br>7,92                                       | 1 600<br>7,12  | 0/ 0,0010<br>0/ 0,0254 | 0,0002/ 0,0005<br>0,0051/ 0,0127 | 0,0055<br>0,140     | 0,67<br>4,71                          | 1<br>7,06  |
| <b>5</b>          | 3 740<br>16,64           | 600<br>2,67             | 3 470<br>15,44                                      | 3 300<br>14,68 | 0/ 0,0010<br>0/ 0,0254 | 0,0002/ 0,0005<br>0,0051/ 0,0127 | 0,006<br>0,152      | 1,33<br>9,41                          | 3<br>21,18 |
| <b>6</b>          | 5 100<br>22,69           | 800<br>3,56             | 4 980<br>22,15                                      | 4 370<br>19,44 | 0/ 0,0010<br>0/ 0,0254 | 0,0002/ 0,0005<br>0,0051/ 0,0127 | 0,006<br>0,152      | 1,33<br>9,41                          | 4<br>28,25 |
| <b>8</b>          | 7 120<br>31,67           | 1 000<br>4,45           | 6 340<br>28,20                                      | 5 570<br>24,78 | 0/ 0,0010<br>0/ 0,0254 | 0,0002/ 0,0005<br>0,0051/ 0,0127 | 0,007<br>0,178      | 1,33<br>9,41                          | 5<br>35,31 |
| <b>10</b>         | 9 000<br>40,03           | 1 300<br>5,78           | 7 780<br>34,61                                      | 6 860<br>30,51 | 0/ 0,0010<br>0/ 0,0254 | 0,0002/ 0,0005<br>0,0051/ 0,0127 | 0,007<br>0,178      | 2<br>14,12                            | 6<br>42,37 |

3) For average life of 10 000 cycles at  $\theta = 90^\circ$  oscillation, see page 38

4) If G395 load rating is 20% lower

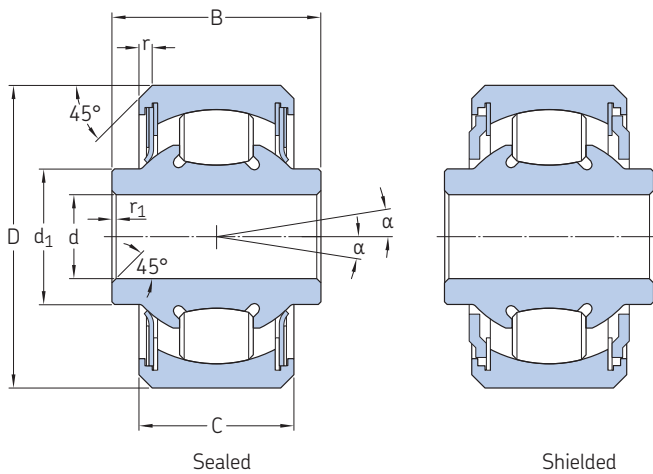
5) Values are valid for bearings with G395. When using G354, values are 20% higher

## 1.27 Spherical roller bearing single row (inch dimensions)

DSRP..

Technical specification –

Product standard –



1.27



### Dimensions

Nominal Dimensions  
bore code

|           | d                | $\Delta d_{mp}$        | D                | $\Delta D_{mp}$        | C               | $\Delta C_s$         | B               | $\Delta B_s$         | $d_1$<br>≈      | $r_1$<br>+0.015/0<br>+0.381/0 | r<br>+0.015/0<br>+0.381/0 | $\alpha$ |
|-----------|------------------|------------------------|------------------|------------------------|-----------------|----------------------|-----------------|----------------------|-----------------|-------------------------------|---------------------------|----------|
| –         | in/mm            |                        |                  |                        |                 |                      |                 |                      |                 |                               |                           | °        |
| <b>4</b>  | 0.2500<br>6,350  | 0/-0.0005<br>0/-0,0127 | 0.9014<br>22,895 | 0/-0.0005<br>0/-0,0127 | 0.464<br>11,785 | 0/-0.005<br>0/-0,127 | 0.625<br>15,875 | 0/-0.005<br>0/-0,127 | 0.404<br>10,260 | 0.005<br>0,127                | 0.032<br>0,813            | 10       |
| <b>5</b>  | 0.3125<br>7,938  | 0/-0.0005<br>0/-0,0127 | 1.2500<br>31,750 | 0/-0.0005<br>0/-0,0127 | 0.656<br>16,662 | 0/-0.005<br>0/-0,127 | 0.812<br>20,624 | 0/-0.005<br>0/-0,127 | 0.515<br>13,081 | 0.015<br>0,381                | 0.032<br>0,813            | 10       |
| <b>6</b>  | 0.3750<br>9,525  | 0/-0.0005<br>0/-0,0127 | 1.4375<br>36,513 | 0/-0.0005<br>0/-0,0127 | 0.750<br>19,050 | 0/-0.005<br>0/-0,127 | 0.937<br>23,799 | 0/-0.005<br>0/-0,127 | 0.564<br>14,325 | 0.015<br>0,381                | 0.032<br>0,813            | 10       |
| <b>8</b>  | 0.5000<br>12,700 | 0/-0.0005<br>0/-0,0127 | 1.6875<br>42,862 | 0/-0.0005<br>0/-0,0127 | 0.812<br>20,624 | 0/-0.005<br>0/-0,127 | 1.000<br>25,400 | 0/-0.005<br>0/-0,127 | 0.775<br>19,685 | 0.015<br>0,381                | 0.044<br>1,118            | 10       |
| <b>10</b> | 0.6250<br>15,875 | 0/-0.0005<br>0/-0,0127 | 1.9375<br>49,212 | 0/-0.0005<br>0/-0,0127 | 0.937<br>23,799 | 0/-0.005<br>0/-0,127 | 1.125<br>28,575 | 0/-0.005<br>0/-0,127 | 0.869<br>22,072 | 0.015<br>0,381                | 0.044<br>1,118            | 10       |
| <b>12</b> | 0.7500<br>19,050 | 0/-0.0005<br>0/-0,0127 | 2.3750<br>60,325 | 0/-0.0005<br>0/-0,0127 | 1.125<br>28,580 | 0/-0.005<br>0/-0,127 | 1.312<br>33,325 | 0/-0.005<br>0/-0,127 | 1.150<br>29,210 | 0.015<br>0,381                | 0.044<br>1,118            | 10       |

### Tolerances, loads and clearance

| Nominal bore code | Mass<br>≈   | Tolerances<br>Kia max | Kea max          | Static limit loads<br>Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | Radial clearance                 |
|-------------------|-------------|-----------------------|------------------|------------------------------------------------|-------------------------|----------------------------------|
| –                 | lb/g        | in/mm                 |                  | lbf/kN                                         |                         | in/mm                            |
| <b>4</b>          | 0.06<br>27  | 0.0010<br>0,0254      | 0.0016<br>0,0406 | 3 025<br>13,46                                 | 907,50<br>4,04          | 0.0004/ 0.0010<br>0,0101/ 0,0254 |
| <b>5</b>          | 0.16<br>73  | 0.0010<br>0,0254      | 0.0016<br>0,0406 | 7 350<br>32,69                                 | 2 205<br>9,81           | 0.0004/ 0.0010<br>0,0101/ 0,0254 |
| <b>6</b>          | 0.24<br>109 | 0.0010<br>0,0254      | 0.0016<br>0,0406 | 9 600<br>42,70                                 | 2 880<br>12,81          | 0.0004/ 0.0010<br>0,0101/ 0,0254 |
| <b>8</b>          | 0.36<br>163 | 0.0010<br>0,0254      | 0.0016<br>0,0406 | 12 500<br>55,60                                | 3 750<br>16,68          | 0.0004/ 0.0010<br>0,0101/ 0,0254 |
| <b>10</b>         | 0.55<br>249 | 0.0010<br>0,0254      | 0.0016<br>0,0406 | 17 700<br>78,73                                | 5 310<br>23,62          | 0.0004/ 0.0010<br>0,0101/ 0,0254 |
| <b>12</b>         | 1.05<br>476 | 0.0010<br>0,0254      | 0.0016<br>0,0460 | 26 900<br>119,67                               | 8 070<br>35,90          | 0.0004/ 0.0010<br>0,0101/ 0,0254 |

## Designation system

Examples: ZWDSRP10SK1CP55RP01  
DSRP 4P

ZW DSRP 10 SK1 CP55 RP01

### Material and surface treatment

|         |                                              |
|---------|----------------------------------------------|
| No code | Cadmium plated bearing steel                 |
| W       | Corrosion-resistant steel                    |
| S       | Zinc-nickel plated bearing steel             |
| ZW      | Cadmium plated corrosion-resistant steel     |
| SZW     | Zinc-nickel plated corrosion-resistant steel |

### Basic designation

Bore code (multiples of 1/16<sup>th</sup> inch)

### Variation

|      | Lubricant | Version  |
|------|-----------|----------|
| SK1  | G354      | Sealed   |
| S181 | G395      | Sealed   |
| PG81 | G395      | Shielded |
| P    | G354      | Shielded |

### Passivation

|                    |                                      |
|--------------------|--------------------------------------|
| No code            | Not treated                          |
| CP55 <sup>1)</sup> | Passivated corrosion-resistant steel |

### Oversize

|         |                                            |
|---------|--------------------------------------------|
| No code | Standard outer diameter size               |
| RP01    | 0.010 in/0,254 mm oversized outer diameter |
| RP02    | 0.020 in/0,508 mm oversized outer diameter |

<sup>1)</sup> Available only for corrosion-resistant steel material without other surface treatment

# Cross-reference

## Metric bearings

1

| EN part number | SKF designation      |
|----------------|----------------------|
| EN3045Ad'P     | JNA <b>d</b> DN744   |
| EN3045Ad'E     | JNA <b>d</b> EDN744  |
| EN3045Bd'P     | JNA <b>d</b> DN814   |
| EN3045Bd'E     | JNA <b>d</b> EDN814  |
| EN3046Ad'P     | ZJNA <b>d</b> DN744  |
| EN3046Ad'E     | ZJNA <b>d</b> EDN744 |
| EN3046Bd'P     | ZJNA <b>d</b> DN814  |
| EN3046Bd'E     | ZJNA <b>d</b> EDN814 |
| EN3047Ad'P     | WJNA <b>d</b> DN744  |
| EN3047Ad'E     | WJNA <b>d</b> EDN744 |
| EN3047Bd'P     | WJNA <b>d</b> DN814  |
| EN3047Bd'E     | WJNA <b>d</b> EDN814 |
| EN3284Ad'P     | JNA <b>d</b> N743    |
| EN3284Ad'E     | JNA <b>d</b> EN743   |
| EN3284Bd'P     | JNA <b>d</b> N813    |
| EN3284Bd'E     | JNA <b>d</b> EN813   |
| EN3285Ad'P     | ZJNA <b>d</b> N743   |
| EN3285Ad'E     | ZJNA <b>d</b> EN743  |
| EN3285Bd'P     | ZJNA <b>d</b> N813   |
| EN3285Bd'E     | ZJNA <b>d</b> EN813  |
| EN3286Ad'P     | WJNA <b>d</b> N743   |
| EN3286Ad'E     | WJNA <b>d</b> EN743  |
| EN3286Bd'P     | WJNA <b>d</b> N813   |
| EN3286Bd'E     | WJNA <b>d</b> EN813  |

Where

**d** = Bore code**d'** = d with a 0 replacing the space for  $d \leq 8$   
d for  $d \geq 10$ 

### Example

| EN part number      | SKF designation       |
|---------------------|-----------------------|
| EN3045A <b>06</b> P | JNA <b>6</b> DN744    |
| EN3046A <b>10</b> E | ZJNA <b>10</b> EDN744 |
| EN3284B <b>15</b> P | JNA <b>15</b> N813    |
| EN3286B <b>25</b> E | WJNA <b>25</b> EN813  |

| EN part number      | SKF designation         |
|---------------------|-------------------------|
| EN4033A <b>d</b> P  | WATA <b>d</b> N745      |
| EN4033A <b>d</b> E  | WATA <b>d</b> EN745     |
| EN4033B <b>d</b> P  | WATA <b>d</b> N815      |
| EN4033B <b>d</b> E  | WATA <b>d</b> EN815     |
| EN4033A <b>d</b> PT | WATA <b>d</b> N745CP55  |
| EN4033A <b>d</b> ET | WATA <b>d</b> EN745CP55 |
| EN4033B <b>d</b> PT | WATA <b>d</b> N815CP55  |
| EN4033B <b>d</b> ET | WATA <b>d</b> EN815CP55 |
| EN3281A <b>d</b> P  | TA <b>d</b> N743        |
| EN3281A <b>d</b> E  | TA <b>d</b> EN743       |
| EN3281B <b>d</b> P  | TA <b>d</b> N813        |
| EN3281B <b>d</b> E  | TA <b>d</b> EN813       |
| EN3282A <b>d</b> P  | ZTA <b>d</b> N743       |
| EN3282A <b>d</b> E  | ZTA <b>d</b> EN743      |
| EN3282B <b>d</b> P  | ZTA <b>d</b> N813       |
| EN3282B <b>d</b> E  | ZTA <b>d</b> EN813      |
| EN3283A <b>d</b> P  | WATA <b>d</b> N743      |
| EN3283A <b>d</b> E  | WATA <b>d</b> EN743     |
| EN3283B <b>d</b> P  | WATA <b>d</b> N813      |
| EN3283B <b>d</b> E  | WATA <b>d</b> EN813     |

Where

**d** = Bore code

### Example

| EN part number       | SKF designation         |
|----------------------|-------------------------|
| EN4033B <b>10</b> P  | WATA <b>10</b> N815     |
| EN4033B <b>17</b> PT | WATA <b>17</b> N815CP55 |
| EN3281A <b>25</b> E  | TA <b>25</b> EN743      |
| EN3283B <b>40</b> E  | WATA <b>40</b> EN813    |

| EN part number | SKF designation |
|----------------|-----------------|
| EN3056Ad'P     | AGNd            |
| EN3056Ad'E     | AGNdE           |
| EN3056Bd'P     | AGNdG81         |
| EN3056Bd'E     | AGNdEG81        |
| EN3057Ad'P     | ZAGNd           |
| EN3057Ad'E     | ZAGNdE          |
| EN3057Bd'P     | ZAGNdG81        |
| EN3057Bd'E     | ZAGNdEG81       |
| EN3058Ad'P     | WAGNd           |
| EN3058Ad'E     | WAGNdE          |
| EN3058Bd'P     | WAGNdG81        |
| EN3058Bd'E     | WAGNdEG81       |

Where

**d** = Bore code

**d'** = d with a 0 replacing the space for d = 8  
d for d ≥ 10

#### Example

| EN part number      | SKF designation     |
|---------------------|---------------------|
| EN3056A <b>08</b> P | AGN <b>8</b>        |
| EN3057B <b>12</b> P | ZAGN <b>12</b> G81  |
| EN3058B <b>20</b> E | WAGN <b>20</b> EG81 |

| EN part number | SKF designation           |
|----------------|---------------------------|
| EN3059AdPC     | TRCE <b>d</b> TN741       |
| EN3059AdPD     | TRCE <b>d</b> TCN741      |
| EN3059AdEC     | TRCE <b>d</b> EN741       |
| EN3059AdED     | TRCE <b>d</b> ECN741      |
| EN3059BdPC     | TRCE <b>d</b> TN811       |
| EN3059BdPD     | TRCE <b>d</b> TCN811      |
| EN3059BdEC     | TRCE <b>d</b> EN811       |
| EN3059BdED     | TRCE <b>d</b> ECN811      |
| EN3060AdPC     | ZTRCE <b>d</b> TN741      |
| EN3060AdPD     | ZTRCE <b>d</b> TCN741     |
| EN3060AdEC     | ZTRCE <b>d</b> EN741      |
| EN3060AdED     | ZTRCE <b>d</b> ECN741     |
| EN3060BdPC     | ZTRCE <b>d</b> TN811      |
| EN3060BdPD     | ZTRCE <b>d</b> TCN811     |
| EN3060BdEC     | ZTRCE <b>d</b> EN811      |
| EN3060BdED     | ZTRCE <b>d</b> ECN811     |
| EN3061AdPC     | XTRCE <b>d</b> TN741      |
| EN3061AdPD     | XTRCE <b>d</b> TCN741     |
| EN3061AdEC     | XTRCE <b>d</b> EN741      |
| EN3061AdED     | XTRCE <b>d</b> ECN741     |
| EN3061BdPC     | XTRCE <b>d</b> TN811      |
| EN3061BdPD     | XTRCE <b>d</b> TCN811     |
| EN3061BdEC     | XTRCE <b>d</b> EN811      |
| EN3061BdED     | XTRCE <b>d</b> ECN811     |
| EN3061AdPCT    | XTRCE <b>d</b> TN741CP55  |
| EN3061AdPDT    | XTRCE <b>d</b> TCN741CP55 |
| EN3061AdECT    | XTRCE <b>d</b> EN741CP55  |
| EN3061AdEDT    | XTRCE <b>d</b> ECN741CP55 |
| EN3061BdPCT    | XTRCE <b>d</b> TN811CP55  |
| EN3061BdPDT    | XTRCE <b>d</b> TCN811CP55 |
| EN3061BdECT    | XTRCE <b>d</b> EN811CP55  |
| EN3061BdEDT    | XTRCE <b>d</b> ECN811CP55 |

Where

**d** = Bore code

#### Example

| EN part number        | SKF designation            |
|-----------------------|----------------------------|
| EN3059A <b>16</b> PC  | TRCE <b>16</b> TN741       |
| EN3060A <b>25</b> ED  | ZTRCE <b>25</b> ECN741     |
| EN3061B <b>40</b> PD  | XTRCE <b>40</b> TCN811     |
| EN3061B <b>50</b> PDT | XTRCE <b>50</b> TCN811CP55 |

## Metric bearings

1

| EN part number                | SKF designation            |
|-------------------------------|----------------------------|
| EN4041A <b>d</b> PC           | XTRCEI <b>d</b> TN741      |
| EN4041A <b>d</b> PD           | XTRCEI <b>d</b> TCN741     |
| EN4041A <b>d</b> EC           | XTRCEI <b>d</b> EN741      |
| EN4041A <b>d</b> ED           | XTRCEI <b>d</b> ECN741     |
| EN4041B <b>d</b> PC           | XTRCEI <b>d</b> TN811      |
| EN4041B <b>d</b> PD           | XTRCEI <b>d</b> TCN811     |
| EN4041B <b>d</b> EC           | XTRCEI <b>d</b> EN811      |
| EN4041B <b>d</b> ED           | XTRCEI <b>d</b> ECN811     |
| EN4041A <b>d</b> PCT          | XTRCEI <b>d</b> TN741CP55  |
| EN4041A <b>d</b> PDT          | XTRCEI <b>d</b> TCN741CP55 |
| EN4041A <b>d</b> ECT          | XTRCEI <b>d</b> EN741CP55  |
| EN4041A <b>d</b> EDT          | XTRCEI <b>d</b> ECN741CP55 |
| EN4041B <b>d</b> PCT          | XTRCEI <b>d</b> TN811CP55  |
| EN4041B <b>d</b> PDT          | XTRCEI <b>d</b> TCN811CP55 |
| EN4041B <b>d</b> ECT          | XTRCEI <b>d</b> EN811CP55  |
| EN4041B <b>d</b> EDT          | XTRCEI <b>d</b> ECN811CP55 |
| Where<br><b>d</b> = Bore code |                            |
| <b>Example</b>                |                            |
| EN part number                | SKF designation            |
| EN4041A <b>35</b> PC          | XTRCEI <b>35</b> TN741     |
| EN4041A <b>45</b> PCT         | XTRCEI <b>45</b> TN741CP55 |

| EN part number                                                              | SKF designation                         |
|-----------------------------------------------------------------------------|-----------------------------------------|
| EN4034A <b>d</b> P                                                          | WKNRCE <b>d</b> N743 <sup>1)</sup>      |
| EN4034A <b>d</b> E                                                          | WKNRCE <b>d</b> EN743 <sup>1)</sup>     |
| EN4034B <b>d</b> P                                                          | WKNRCE <b>d</b> N813 <sup>1)</sup>      |
| EN4034B <b>d</b> E                                                          | WKNRCE <b>d</b> EN813 <sup>1)</sup>     |
| EN4034A <b>d</b> PT                                                         | WKNRCE <b>d</b> N743CP55 <sup>1)</sup>  |
| EN4034A <b>d</b> ET                                                         | WKNRCE <b>d</b> EN743CP55 <sup>1)</sup> |
| EN4034B <b>d</b> PT                                                         | WKNRCE <b>d</b> N813CP55 <sup>1)</sup>  |
| EN4034B <b>d</b> ET                                                         | WKNRCE <b>d</b> EN813CP55 <sup>1)</sup> |
| Where<br><b>d</b> = Bore code<br><sup>1)</sup> Except for d = 35 and d = 40 |                                         |
| <b>Example</b>                                                              |                                         |
| EN part number                                                              | SKF designation                         |
| EN4034A <b>16</b> P                                                         | WKNRCE <b>16</b> N743                   |
| EN4034A <b>16</b> PT                                                        | WKNRCE <b>16</b> N743CP55               |

| EN part number                                                                                                          | SKF designation     |
|-------------------------------------------------------------------------------------------------------------------------|---------------------|
| EN3287AR <b>d</b> P                                                                                                     | KN <b>d</b> 'N745   |
| EN3287AR <b>d</b> E                                                                                                     | KN <b>d</b> EN745   |
| EN3287AN <b>d</b> P                                                                                                     | KN <b>d</b> 'N743   |
| EN3287AN <b>d</b> E                                                                                                     | KN <b>d</b> EN743   |
| EN3287AL <b>d</b> P                                                                                                     | KN <b>d</b> 'N746   |
| EN3287AL <b>d</b> E                                                                                                     | KN <b>d</b> EN746   |
| EN3287BR <b>d</b> P                                                                                                     | KN <b>d</b> 'N815   |
| EN3287BR <b>d</b> E                                                                                                     | KN <b>d</b> EN815   |
| EN3287BN <b>d</b> P                                                                                                     | KN <b>d</b> 'N813   |
| EN3287BN <b>d</b> E                                                                                                     | KN <b>d</b> EN813   |
| EN3287BL <b>d</b> P                                                                                                     | KN <b>d</b> 'N816   |
| EN3287BL <b>d</b> E                                                                                                     | KN <b>d</b> EN816   |
| EN3288AR <b>d</b> P                                                                                                     | ZKN <b>d</b> 'N745  |
| EN3288AR <b>d</b> E                                                                                                     | ZKN <b>d</b> EN745  |
| EN3288AN <b>d</b> P                                                                                                     | ZKN <b>d</b> 'N743  |
| EN3288AN <b>d</b> E                                                                                                     | ZKN <b>d</b> EN743  |
| EN3288AL <b>d</b> P                                                                                                     | ZKN <b>d</b> 'N746  |
| EN3288AL <b>d</b> E                                                                                                     | ZKN <b>d</b> EN746  |
| EN3288BR <b>d</b> P                                                                                                     | ZKN <b>d</b> 'N815  |
| EN3288BR <b>d</b> E                                                                                                     | ZKN <b>d</b> EN815  |
| EN3288BN <b>d</b> P                                                                                                     | ZKN <b>d</b> 'N813  |
| EN3288BN <b>d</b> E                                                                                                     | ZKN <b>d</b> EN813  |
| EN3288BL <b>d</b> P                                                                                                     | ZKN <b>d</b> 'N816  |
| EN3288BL <b>d</b> E                                                                                                     | ZKN <b>d</b> EN816  |
| EN3289AR <b>d</b> P                                                                                                     | WKN <b>d</b> 'N745  |
| EN3289AR <b>d</b> E                                                                                                     | WKN <b>d</b> EN745  |
| EN3289AN <b>d</b> P                                                                                                     | WKN <b>d</b> 'N743  |
| EN3289AN <b>d</b> E                                                                                                     | WKN <b>d</b> EN743  |
| EN3289AL <b>d</b> P                                                                                                     | WKN <b>d</b> 'N746  |
| EN3289AL <b>d</b> E                                                                                                     | WKN <b>d</b> EN746  |
| EN3289BR <b>d</b> P                                                                                                     | WKN <b>d</b> 'N815  |
| EN3289BR <b>d</b> E                                                                                                     | WKN <b>d</b> EN815  |
| EN3289BN <b>d</b> P                                                                                                     | WKN <b>d</b> 'N813  |
| EN3289BN <b>d</b> E                                                                                                     | WKN <b>d</b> EN813  |
| EN3289BL <b>d</b> P                                                                                                     | WKN <b>d</b> 'N816  |
| EN3289BL <b>d</b> E                                                                                                     | WKN <b>d</b> EN816  |
| Where<br><b>d</b> = Bore code<br><b>d'</b> = d with a 0 replacing the space for d ≤ 6<br>8/24 for d = 8<br>d for d ≥ 10 |                     |
| <b>Example</b>                                                                                                          |                     |
| EN part number                                                                                                          | SKF designation     |
| EN3287AR <b>05</b> P                                                                                                    | KN <b>5</b> N745    |
| EN3288AL <b>10</b> E                                                                                                    | ZKN <b>10</b> EN746 |
| EN3289BN <b>17</b> P                                                                                                    | WKN <b>17</b> N813  |

| EN part number       | SKF designation                                                    |                                                             |
|----------------------|--------------------------------------------------------------------|-------------------------------------------------------------|
| EN3053A <b>d</b> 'P  | K <b>d</b> FN743                                                   | KN <b>d</b> FN743<br>(For <b>d</b> = 12 and <b>d</b> = 15)  |
| EN3053A <b>d</b> 'P1 | KN <b>d</b> FN743<br>(Except for <b>d</b> = 12 and <b>d</b> = 15)  |                                                             |
| EN3053B <b>d</b> 'P  | K <b>d</b> FN813                                                   | KN <b>d</b> FN813<br>(For <b>d</b> = 12 and <b>d</b> = 15)  |
| EN3053B <b>d</b> 'P1 | KN <b>d</b> FN813<br>(Except for <b>d</b> = 12 and <b>d</b> = 15)  |                                                             |
| EN3054A <b>d</b> 'P  | ZK <b>d</b> FN743                                                  | ZKN <b>d</b> FN743<br>(For <b>d</b> = 12 and <b>d</b> = 15) |
| EN3054A <b>d</b> 'P1 | ZKN <b>d</b> FN743<br>(Except for <b>d</b> = 12 and <b>d</b> = 15) |                                                             |
| EN3054B <b>d</b> 'P  | ZK <b>d</b> FN813                                                  | ZKN <b>d</b> FN813<br>(For <b>d</b> = 12 and <b>d</b> = 15) |
| EN3054B <b>d</b> 'P1 | ZKN <b>d</b> FN813<br>(Except for <b>d</b> = 12 and <b>d</b> = 15) |                                                             |
| EN3055A <b>d</b> 'P  | WK <b>d</b> FN743                                                  | WKN <b>d</b> FN743<br>(For <b>d</b> = 12 and <b>d</b> = 15) |
| EN3055A <b>d</b> 'P1 | WKN <b>d</b> FN743<br>(Except for <b>d</b> = 12 and <b>d</b> = 15) |                                                             |
| EN3055B <b>d</b> 'P  | WK <b>d</b> FN813                                                  | WKN <b>d</b> FN813<br>(For <b>d</b> = 12 and <b>d</b> = 15) |
| EN3055B <b>d</b> 'P1 | WKN <b>d</b> FN813<br>(Except for <b>d</b> = 12 and <b>d</b> = 15) |                                                             |

Where

**d** = Bore code**d'** = d with a 0 replacing the space for  $d \leq 8$   
d for  $d \geq 10$ **Example**

| EN part number       | SKF designation     |
|----------------------|---------------------|
| EN3053A <b>10</b> P  | K <b>10</b> FN743   |
| EN3053A <b>12</b> P  | KN <b>12</b> FN743  |
| EN3053A <b>10</b> P1 | KN <b>10</b> FN743  |
| EN3054B <b>06</b> P  | ZK <b>6</b> FN813   |
| EN3054B <b>15</b> P  | ZKN <b>15</b> FN813 |
| EN3054B <b>10</b> P1 | ZKN <b>10</b> FN813 |
| EN3055A <b>08</b> P  | WK <b>8</b> FN743   |
| EN3055A <b>12</b> P  | WKN <b>12</b> FN743 |
| EN3055A <b>10</b> P1 | WKN <b>10</b> FN743 |

| EN part number       | SKF designation     |
|----------------------|---------------------|
| EN3290AK <b>d</b> 'P | KNA <b>d</b> FN743  |
| EN3290AK <b>d</b> 'E | KNA <b>d</b> FN743  |
| EN3290AR <b>d</b> 'P | KNA <b>d</b> FN745  |
| EN3290AR <b>d</b> 'E | KNA <b>d</b> FN745  |
| EN3290BK <b>d</b> 'P | KNA <b>d</b> FN813  |
| EN3290BK <b>d</b> 'E | KNA <b>d</b> FN813  |
| EN3290BR <b>d</b> 'P | KNA <b>d</b> FN815  |
| EN3290BR <b>d</b> 'E | KNA <b>d</b> FN815  |
| EN3291AK <b>d</b> 'P | ZKNA <b>d</b> FN743 |
| EN3291AK <b>d</b> 'E | ZKNA <b>d</b> FN743 |
| EN3291AR <b>d</b> 'P | ZKNA <b>d</b> FN745 |
| EN3291AR <b>d</b> 'E | ZKNA <b>d</b> FN745 |
| EN3291BK <b>d</b> 'P | ZKNA <b>d</b> FN813 |
| EN3291BK <b>d</b> 'E | ZKNA <b>d</b> FN813 |
| EN3291BR <b>d</b> 'P | ZKNA <b>d</b> FN815 |
| EN3291BR <b>d</b> 'E | ZKNA <b>d</b> FN815 |
| EN3292AK <b>d</b> 'P | WKN <b>d</b> FN743  |
| EN3292AK <b>d</b> 'E | WKN <b>d</b> FN743  |
| EN3292AR <b>d</b> 'P | WKN <b>d</b> FN745  |
| EN3292AR <b>d</b> 'E | WKN <b>d</b> FN745  |
| EN3292BK <b>d</b> 'P | WKN <b>d</b> FN813  |
| EN3292BK <b>d</b> 'E | WKN <b>d</b> FN813  |
| EN3292BR <b>d</b> 'P | WKN <b>d</b> FN815  |
| EN3292BR <b>d</b> 'E | WKN <b>d</b> FN815  |

Where

**d** = Bore code**d'** = d with a 0 replacing the space for  $d = 8$   
d for  $d \geq 10$ **Example**

| EN part number       | SKF designation      |
|----------------------|----------------------|
| EN3290AK <b>10</b> P | KNA <b>10</b> FN743  |
| EN3291AR <b>17</b> P | ZKNA <b>17</b> FN745 |
| EN3292BR <b>20</b> E | WKN <b>20</b> FN815  |

## Inch bearings

1

| AS part number         | SKF designation     |
|------------------------|---------------------|
| MS27640- <b>d'</b> GE  | SKP <b>d</b> SK2    |
| MS27640- <b>d'</b> G   | KP <b>d</b> SK2     |
| MS27640- <b>d'</b> E   | SKP <b>d</b> S281   |
| MS27640- <b>d'</b>     | KP <b>d</b> S281    |
| MS27640- <b>d'</b> RGE | SKP <b>d</b> SK2-R  |
| MS27640- <b>d'</b> RG  | KP <b>d</b> SK2-R   |
| MS27640- <b>d'</b> RE  | SKP <b>d</b> S281-R |
| MS27640- <b>d'</b> R   | KP <b>d</b> S281-R  |
| MS27640-3AGE           | SKP 3LSK2           |
| MS27640-3AG            | KP 3LSK2            |
| MS27640-3AE            | SKP 3LS281          |
| MS27640-3A             | KP 3LS281           |
| MS27640-3ARGE          | SKP 3LSK2-R         |
| MS27640-3ARG           | KP 3LSK2-R          |
| MS27640-3ARE           | SKP 3LS281-R        |
| MS27640-3AR            | KP 3LS281-R         |

Where  
**d** = Bore code  
**d'** = d without space for  $d \leq 8$   
d for  $d \geq 10$

**Example**

| AS part number         | SKF designation     |
|------------------------|---------------------|
| MS27640- <b>5</b> GE   | SKP <b>5</b> SK2    |
| MS27640- <b>3</b> ARGE | SKP <b>3</b> LSK2-R |

| AS part number         | SKF designation      |
|------------------------|----------------------|
| MS27641- <b>d'</b> GE  | SKP <b>d</b> ASK2    |
| MS27641- <b>d'</b> G   | KP <b>d</b> ASK2     |
| MS27641- <b>d'</b> E   | SKP <b>d</b> AS281   |
| MS27641- <b>d'</b>     | KP <b>d</b> AS281    |
| MS27641- <b>d'</b> RGE | SKP <b>d</b> ASK2-R  |
| MS27641- <b>d'</b> RG  | KP <b>d</b> ASK2-R   |
| MS27641- <b>d'</b> RE  | SKP <b>d</b> AS281-R |
| MS27641- <b>d'</b> R   | KP <b>d</b> AS281-R  |

Where  
**d** = Bore code  
**d'** = d without space for  $d \leq 8$   
d for  $d \geq 10$

**Example**

| AS part number         | SKF designation      |
|------------------------|----------------------|
| MS27641- <b>10</b> RGE | SKP <b>10</b> ASK2-R |

| AS part number        | SKF designation     |
|-----------------------|---------------------|
| MS27642- <b>d</b> GE  | SKP <b>d</b> BSK2   |
| MS27642- <b>d</b> G   | KP <b>d</b> BSK2    |
| MS27642- <b>d</b> E   | SKP <b>d</b> BS281  |
| MS27642- <b>d</b>     | KP <b>d</b> BS281   |
| MS27642- <b>d</b> SGE | SMKP <b>d</b> BSK2  |
| MS27642- <b>d</b> SG  | MKP <b>d</b> BSK2   |
| MS27642- <b>d</b> SE  | SMKP <b>d</b> BS281 |
| MS27642- <b>d</b> S   | MKP <b>d</b> BS281  |

Where  
**d** = Bore code

**Example**

| AS part number         | SKF designation     |
|------------------------|---------------------|
| MS27642- <b>23</b> SGE | SMKP <b>23</b> BSK2 |



| AS part number       | SKF designation      |
|----------------------|----------------------|
| MS27646- <b>d</b> GE | SB5 <b>d</b> DDSK2   |
| MS27646- <b>d</b> G  | B5 <b>d</b> DDSK2    |
| MS27646- <b>d</b> E  | SB5 <b>d</b> DDS281  |
| MS27646- <b>d</b>    | B5 <b>d</b> DDS281   |
| MS21428- <b>d</b> GE | SMB5 <b>d</b> DDSK2  |
| MS21428- <b>d</b> G  | MB5 <b>d</b> DDSK2   |
| MS21428- <b>d</b> E  | SMB5 <b>d</b> DDS281 |
| MS21428- <b>d</b>    | MB5 <b>d</b> DDS281  |

Where  
5**d** = Bore code from product B500 **page 92**

**Example**

| AS part number       | SKF designation    |
|----------------------|--------------------|
| MS27646- <b>4</b> GE | SB5 <b>4</b> DDSK2 |
| MS21428- <b>4</b> G  | MB5 <b>4</b> DDSK2 |

| AS part number        | SKF designation    |
|-----------------------|--------------------|
| MS27644- <b>d</b> 'GE | SDPP <b>d</b> SK2  |
| MS27644- <b>d</b> 'G  | DPP <b>d</b> SK2   |
| MS27644- <b>d</b> 'E  | SDPP <b>d</b> S281 |
| MS27644- <b>d</b> '   | DPP <b>d</b> S281  |

Where  
**d** = Bore code  
**d**' = d without space for  $d \leq 8$   
d for  $d \geq 10$

**Example**

| AS part number       | SKF designation   |
|----------------------|-------------------|
| MS27644- <b>6</b> GE | SDPP <b>6</b> SK2 |

| AS part number                       | SKF designation                   |
|--------------------------------------|-----------------------------------|
| MS27647- <b>d</b> 'RLE <sup>1)</sup> | SDW <b>d</b> SK2-R <sup>1)</sup>  |
| MS27647- <b>d</b> 'RL <sup>1)</sup>  | DW <b>d</b> SK2-R <sup>1)</sup>   |
| MS27647- <b>d</b> 'RE <sup>1)</sup>  | SDW <b>d</b> S281-R <sup>1)</sup> |
| MS27647- <b>d</b> 'R <sup>1)</sup>   | DW <b>d</b> S281-R <sup>1)</sup>  |
| MS27647- <b>d</b> 'LE <sup>1)</sup>  | SDW <b>d</b> SK2 <sup>1)</sup>    |
| MS27647- <b>d</b> 'L <sup>1)</sup>   | DW <b>d</b> SK2 <sup>1)</sup>     |
| MS27647- <b>d</b> 'E <sup>1)</sup>   | SDW <b>d</b> S281 <sup>1)</sup>   |
| MS27647- <b>d</b> ' <sup>1)</sup>    | DW <b>d</b> S281 <sup>1)</sup>    |
| MS27647-4RLE                         | SDW 4KSK2-R                       |
| MS27647-4RL                          | DW 4KSK2-R                        |
| MS27647-4RE                          | SDW 4KS281-R                      |
| MS27647-4R                           | DW 4KS281-R                       |
| MS27647-4LE                          | SDW 4KSK2                         |
| MS27647-4L                           | DW 4KSK2                          |
| MS27647-4E                           | SDW 4KS281                        |
| MS27647-4                            | DW 4KS281                         |
| MS27647-4ARLE                        | SDW 4K2SK2-R                      |
| MS27647-4ARL                         | DW 4K2SK2-R                       |
| MS27647-4ARE                         | SDW 4K2S281-R                     |
| MS27647-4AR                          | DW 4K2S281-R                      |
| MS27647-4ALE                         | SDW 4K2SK2                        |
| MS27647-4AL                          | DW 4K2SK2                         |
| MS27647-4AE                          | SDW 4K2S281                       |
| MS27647-4A                           | DW 4K2S281                        |

Where  
**d** = Bore code  
**d**' = d without space  
<sup>1)</sup> Except for **d** = 4

**Example**

| AS part number        | SKF designation     |
|-----------------------|---------------------|
| MS27647- <b>5</b> RLE | SDW <b>5</b> SK2-R  |
| MS27647- <b>4</b>     | DW <b>4</b> KS281   |
| MS27647- <b>4</b> AE  | SDW <b>4</b> K2S281 |

## Inch bearings

1

| AS part number                | SKF designation     |
|-------------------------------|---------------------|
| MS27648- <b>d</b> GE          | SKP <b>d</b> BSSK2  |
| MS27648- <b>d</b> G           | KP <b>d</b> BSSK2   |
| MS27648- <b>d</b> E           | SKP <b>d</b> BSS281 |
| MS27648- <b>d</b>             | KP <b>d</b> BSS281  |
| Where<br><b>d</b> = Bore code |                     |
| <b>Example</b>                |                     |
| AS part number                | SKF designation     |
| MS27648- <b>21</b> GE         | SKP <b>21</b> BSSK2 |

| AS part number                                                                                                           | SKF designation       |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------|
| MS27645- <b>d'</b> RGE                                                                                                   | SKSP <b>d</b> SK2-R   |
| MS27645- <b>d'</b> RG                                                                                                    | KSP <b>d</b> SK2-R    |
| MS27645- <b>d'</b> RE                                                                                                    | SKSP <b>d</b> S181-R  |
| MS27645- <b>d'</b> R                                                                                                     | KSP <b>d</b> S181-R   |
| MS27645- <b>d'</b> GE                                                                                                    | SKSP <b>d</b> SK2     |
| MS27645- <b>d'</b> G                                                                                                     | KSP <b>d</b> SK2      |
| MS27645- <b>d'</b> E                                                                                                     | SKSP <b>d</b> S181    |
| MS27645- <b>d'</b>                                                                                                       | KSP <b>d</b> S181     |
| MS27645- <b>d'</b> ARGE <sup>1)</sup>                                                                                    | SKSP <b>d</b> ASK2-R  |
| MS27645- <b>d'</b> ARG <sup>1)</sup>                                                                                     | KSP <b>d</b> ASK2-R   |
| MS27645- <b>d'</b> ARE <sup>1)</sup>                                                                                     | SKSP <b>d</b> AS181-R |
| MS27645- <b>d'</b> AR <sup>1)</sup>                                                                                      | KSP <b>d</b> AS181-R  |
| MS27645- <b>d'</b> AGE <sup>1)</sup>                                                                                     | SKSP <b>d</b> ASK2    |
| MS27645- <b>d'</b> AG <sup>1)</sup>                                                                                      | KSP <b>d</b> ASK2     |
| MS27645- <b>d'</b> AE <sup>1)</sup>                                                                                      | SKSP <b>d</b> AS181   |
| MS27645- <b>d'</b> A <sup>1)</sup>                                                                                       | KSP <b>d</b> AS181    |
| MS27645-3ARGE                                                                                                            | SKSP 3LSK2-R          |
| MS27645-3ARG                                                                                                             | KSP 3LSK2-R           |
| MS27645-3ARE                                                                                                             | SKSP 3LS181-R         |
| MS27645-3AR                                                                                                              | KSP 3LS181-R          |
| MS27645-3AGE                                                                                                             | SKSP 3LSK2            |
| MS27645-3AG                                                                                                              | KSP 3LSK2             |
| MS27645-3AE                                                                                                              | SKSP 3LS181           |
| MS27645-3A                                                                                                               | KSP 3LS181            |
| Where<br><b>d</b> = Bore code<br><b>d'</b> = d without space for d ≤ 8<br>d for d ≥ 10<br><sup>1)</sup> Except for d = 3 |                       |
| <b>Example</b>                                                                                                           |                       |
| AS part number                                                                                                           | SKF designation       |
| MS27645- <b>8</b> RGE                                                                                                    | SKSP <b>8</b> SK2-R   |
| MS27645- <b>5</b> AGE                                                                                                    | SKSP <b>5</b> ASK2    |
| MS27645- <b>3</b> AG                                                                                                     | KSP <b>3</b> LSK2     |

| AS part number         | SKF designation      |
|------------------------|----------------------|
| MS27643- <b>d</b> 'RGE | SDSP <b>d</b> SK1-R  |
| MS27643- <b>d</b> 'RG  | DSP <b>d</b> SK1-R   |
| MS27643- <b>d</b> 'RE  | SDSP <b>d</b> S181-R |
| MS27643- <b>d</b> 'R   | DSP <b>d</b> S181-R  |
| MS27643- <b>d</b> 'GE  | SDSP <b>d</b> SK1    |
| MS27643- <b>d</b> 'G   | DSP <b>d</b> SK1     |
| MS27643- <b>d</b> 'E   | SDSP <b>d</b> S181   |
| MS27643- <b>d</b> '    | DSP <b>d</b> S181    |

Where

**d** = Bore code

**d**' = d without space for  $d \leq 8$

d for  $d \geq 10$

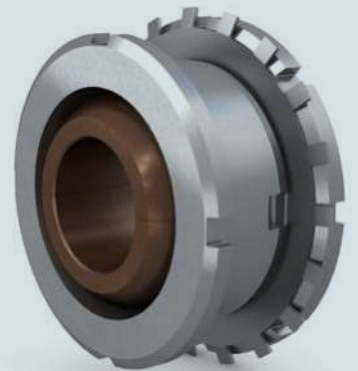
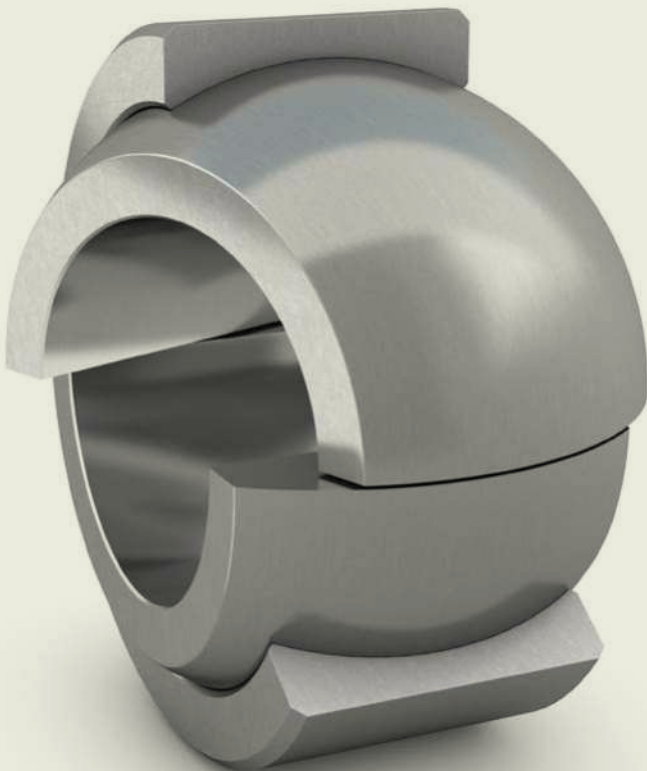
#### Example

| AS part number        | SKF designation     |
|-----------------------|---------------------|
| MS27643- <b>6</b> RGE | SDSP <b>6</b> SK1-R |



2

## Spherical plain bearings



# 2 Spherical plain bearings

|                                                        |            |                                                                                 |            |
|--------------------------------------------------------|------------|---------------------------------------------------------------------------------|------------|
| <b>Bearing terminology</b> .....                       | <b>128</b> | <b>Dismounting</b> .....                                                        | <b>155</b> |
| <b>Bearing types</b> .....                             | <b>129</b> | <b>Storage</b> .....                                                            | <b>155</b> |
| Metal-to-metal spherical plain bearings .....          | 129        | <b>Product tables Metal-to-metal spherical plain bearings</b>                   |            |
| Self-lubricating spherical plain bearings .....        | 130        | <b>Metric dimensions</b> .....                                                  | <b>156</b> |
| Rod ends .....                                         | 130        | <b>2.1</b> Metal-to-metal loader slot, EN 2336, EN 2588 .....                   | 156        |
| Common design features .....                           | 130        | <b>2.2</b> Metal-to-metal loader slot normal, EN 2335 .....                     | 160        |
| Customized bearings .....                              | 131        | <b>2.3</b> Metal-to-metal loader slot normal reinforced .....                   | 164        |
| Basic selection guidelines .....                       | 131        | <b>2.4</b> Metal-to-metal loader slot wide .....                                | 166        |
| <b>Metal-to-metal spherical plain bearings</b> .....   | <b>132</b> | <b>2.5</b> Metal-to-metal swaged light, EN 2335 .....                           | 168        |
| Designs and variants .....                             | 132        | <b>2.6</b> Metal-to-metal swaged narrow .....                                   | 172        |
| Bearing designs .....                                  | 132        | <b>2.7</b> Metal-to-metal swaged wide .....                                     | 176        |
| Bearing variants .....                                 | 132        | <b>2.8</b> Metal-to-metal swaged high misalignment .....                        | 180        |
| Bearing series .....                                   | 132        | <b>2.9</b> Metal-to-metal split .....                                           | 182        |
| Bearing selection process .....                        | 134        | <b>Inch dimensions</b> .....                                                    | <b>184</b> |
| Selecting bearing size and options .....               | 134        | <b>2.10</b> Metal-to-metal loader slot wide .....                               | 184        |
| Load carrying capability .....                         | 134        | <b>2.11</b> Metal-to-metal swaged narrow, AS 21154, AS 21155 .....              | 186        |
| Internal clearance .....                               | 136        | <b>2.12</b> Metal-to-metal swaged narrow, EN 6046 .....                         | 190        |
| Lubrication .....                                      | 137        | <b>2.13</b> Metal-to-metal swaged wide .....                                    | 194        |
| Operating temperature .....                            | 138        | <b>2.14</b> Metal-to-metal swaged wide, EN 4265, EN 4266 .....                  | 198        |
| Bearing data .....                                     | 138        | <b>2.15</b> Metal-to-metal swaged high misalignment .....                       | 202        |
| Material .....                                         | 138        | <b>2.16</b> Metal-to-metal swaged, AS 81936/1, AS 81936/2 .....                 | 206        |
| Surface treatments .....                               | 139        | <b>2.17</b> Metal-to-metal split .....                                          | 210        |
| Dimensions and tolerances .....                        | 140        | <b>Product tables Self-lubricating spherical plain bearings</b>                 |            |
| Sealing and shielding .....                            | 140        | <b>Metric dimensions</b> .....                                                  | <b>214</b> |
| Customized products .....                              | 141        | <b>2.18</b> Self-lubricating light, EN 3048, EN 4037 .....                      | 214        |
| <b>Self-lubricating spherical plain bearings</b> ..... | <b>142</b> | <b>2.19</b> Self-lubricating narrow, EN 2584, EN 4038 .....                     | 216        |
| Designs and variants .....                             | 142        | <b>2.20</b> Self-lubricating wide, EN 2585, EN 4039 .....                       | 220        |
| Bearing selection process .....                        | 142        | <b>2.21</b> Self-lubricating high misalignment, EN 4040 .....                   | 224        |
| Selecting bearing size and options .....               | 142        | <b>2.22</b> Self-lubricating high misalignment .....                            | 226        |
| Load carrying capability .....                         | 144        | <b>2.23</b> Self-lubricating pre-staked .....                                   | 228        |
| Friction and torque .....                              | 146        | <b>Inch dimensions</b> .....                                                    | <b>230</b> |
| Internal clearance .....                               | 147        | <b>2.24</b> Self-lubricating narrow controlled clearance .....                  | 230        |
| Operating temperature .....                            | 147        | <b>2.25</b> Self-lubricating narrow, NSA 8134, NSA 8136 .....                   | 232        |
| Bearing data .....                                     | 148        | <b>2.26</b> Self-lubricating narrow, AS 14101, AS 14104 .....                   | 236        |
| Material .....                                         | 148        | <b>2.27</b> Self-lubricating narrow lined bore, AS 81820/1,<br>AS 81820/4 ..... | 240        |
| Surface treatments .....                               | 149        | <b>2.28</b> Self-lubricating wide, NSA 8135, NSA 8137 .....                     | 244        |
| Dimensions and tolerances .....                        | 149        | <b>2.29</b> Self-lubricating wide, AS 14102, AS 14103 .....                     | 248        |
| Sealing and shielding .....                            | 149        | <b>2.30</b> Self-lubricating wide lined bore, AS 81820/2,<br>AS 81820/3 .....   | 252        |
| Lined bore .....                                       | 150        | <b>2.31</b> Self-lubricating high misalignment .....                            | 256        |
| Customized products .....                              | 150        | <b>2.32</b> Self-lubricating high misalignment .....                            | 258        |
| Legacy products .....                                  | 151        | <b>2.33</b> Self-lubricating high misalignment .....                            | 260        |
| Legacy standards .....                                 | 151        | <b>2.34</b> Self-lubricating pre-staked .....                                   | 264        |
| Customer standards .....                               | 151        | <b>Cross-reference</b> .....                                                    | <b>268</b> |
| <b>Bearing interfaces</b> .....                        | <b>152</b> | Metal-to-metal spherical plain bearings .....                                   | 268        |
| Fits and tolerances .....                              | 152        | Metric bearings .....                                                           | 268        |
| Mounting .....                                         | 153        | Inch bearings .....                                                             | 270        |
| Bearing retention .....                                | 154        | Self-lubricating spherical plain bearings .....                                 | 272        |
| Anvil staking Process .....                            | 154        | Metric bearings .....                                                           | 272        |
| Roller staking .....                                   | 155        | Inch bearings .....                                                             | 274        |
| Threaded or bolted retention plate .....               | 155        |                                                                                 |            |

## 2 Spherical plain bearings

SKF spherical plain bearings provide a lubricated and wear-resistant joint, designed to support loads in radial and axial directions while enabling low friction multi-directional oscillation. When needed, they can also accommodate axial movements along the shaft. See **figures 2 and 3**.

The inner ring of these bearings have a spherical convex outside diameter, while the outer rings have a correspondingly concave inside diameter, see **figure 1**.

The standard range of SKF spherical plain bearings is tailored to meet a variety of operating conditions:

- Load – from low to high, for static or dynamic conditions
- Motion – from quasi-static to highly dynamic, including low to high frequency oscillation
- Environment – for a range of ambient temperatures and environmental conditions

SKF spherical plain bearings provide:

- Long service life
- Minimal maintenance requirements
- High operational reliability

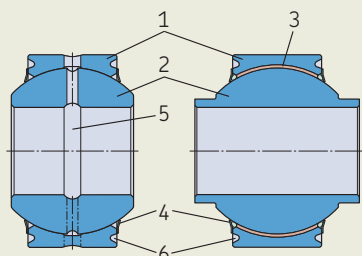
Spherical plain bearings are used widely in fixed wing and helicopter aircraft structures.

They can be found in many applications, including:

- Aerostructure
- Flight controls
- Rotors
- Actuators, attachment points and hinges
- Engine attachments
- Landing gears
- Doors

SKF Application Engineers can provide additional help to select the most suitable standard bearing solution or design a customized bearing to meet your application requirements.

Figure 1



### Bearing terminology

(Figure 1)

- 1 Outer ring
- 2 Inner ring
- 3 Liner
- 4 Seal/shield
- 5 Lubrication groove
- 6 Staking groove

Figure 2

#### Bearing motion

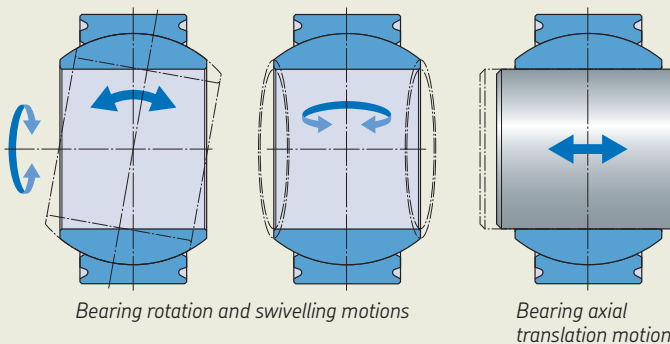
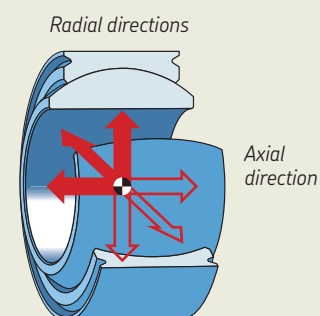


Figure 3

#### Bearing radial and axial directions



# Bearing types

SKF supplies two types of spherical plain bearings (figure 4). The difference is in the sliding contact surface combination:

- Metal-to-metal
- Self-lubricating

## Basic selection criteria

Metal-to-metal bearings are composed of two metallic rings that can slide directly on each other. These bearings require grease lubrication.

In self-lubricating bearings, the grease is replaced by a liner containing PTFE (polytetrafluoroethylene). The liner is bonded to the spherical contact surface in the outer ring.

To quickly determine what is suitable for your application, use table 2, page 131.

# Metal-to-metal spherical plain bearings

Metal-to-metal spherical plain bearings use combinations of materials to accommodate different application conditions (such as static load, dynamic load, high temperature, liquid contamination) and corrosion resistance requirements, see table 2, page 131. Standard metal-to-metal spherical plain bearings use either steel for both the inner and outer rings or steel for one of the rings and bronze for the other (table 1).

Metal-to-metal bearings are supplied greased, ready for operation. Depending on application conditions, they may require periodic relubrication. Bearing variants with lubrication holes and grooves in the inner and/or outer rings are therefore available. Refer to Lubrication page 137.

Good lubrication is necessary for optimal bearing performance.

Metal-to-metal bearings are designed to operate with clearance in the spherical contact. For additional information, refer to Internal clearance page 136.

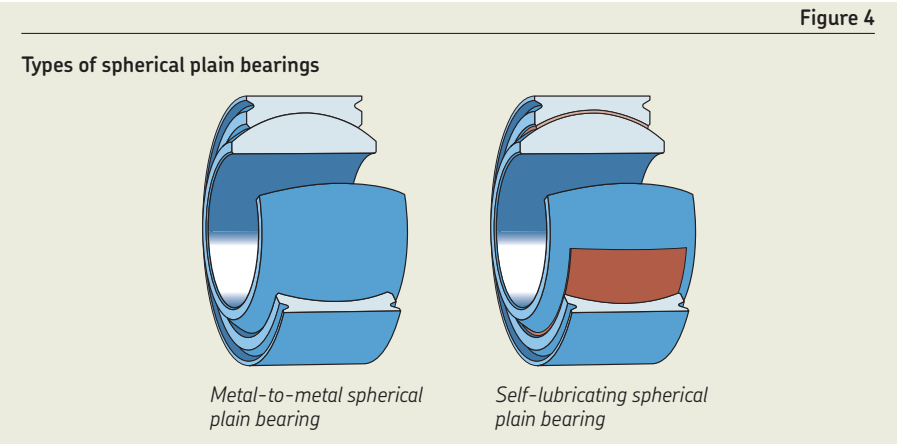


Table 1

Standard material combinations for metal-to-metal spherical plain bearings

| Inner ring | Outer ring |
|------------|------------|
| Steel      | Steel      |
| Bronze     | Steel      |
| Steel      | Bronze     |

## Self-lubricating spherical plain bearings

Self-lubricating spherical plain bearings are “maintenance-free” and can accommodate relatively high loads.

“Maintenance-free” is an industry-wide term used to describe bearings with self-lubricating sliding contact surface combinations. The term “maintenance-free” does not imply that these bearings should not be inspected as part of a regularly scheduled maintenance programme, but that they offer a number of advantages including no need for relubrication.

As standard, inner and outer rings are manufactured from corrosion-resistant steel.

A liner containing PTFE is bonded to the spherical contact surface in the outer ring. It provides a low wear rate, relatively low friction, and a long bearing life especially under dynamic conditions. The bearing life under dynamic conditions can be further increased with SKF coating technologies applied on the spherical surfaces. Refer to *Surface coating* **page 148** and *Surface treatments* **page 149**.

For applications requiring axial movements along the shaft or when a secondary rotational motion in the bore is needed, self-lubricating bearings can be supplied with a liner in the bore of the inner ring. Refer to *Lined bore* **page 150**.

Self-lubricating bearings can be specified by their unloaded starting torque or supplied with controlled clearance in the spherical contact between the inner and outer rings. Refer to *Internal clearance* **page 147** and *Friction and torque* **page 146**.

## Rod ends

Spherical plain bearings can be supplied as part of rod ends (**figure 5**). Rod ends are used for easy attachment of a bearing to the airframe structure. For information about these products, refer to *Rod Ends* **page 280**.

## Common design features

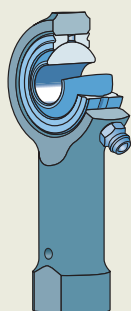
The standard assortment of SKF spherical plain bearings is comprised of a wide range of designs, dimension series and sizes. It also includes a large variety of optional features (lubrication, sealing, surface treatments, etc.) to meet specific application needs. The most important options are related to outer ring design, surface treatments and coatings, seals and shields.

## Outer ring design

The outer ring design supports the desired mounting method, see **figure 6**:

- **Chamfered outer ring**  
Bearings with this feature are typically used when easy replacement is required. A suitable axial retention solution should be selected, refer to *Threaded or bolted retention plate* **page 155**.
- **Staking groove**  
This enables positive retention. Staking grooves are machined in the outer ring and can be deformed into the housing's chamfers as a non-dismountable locking feature. Bearings can also be supplied with a pre-staked lip on the outer ring.

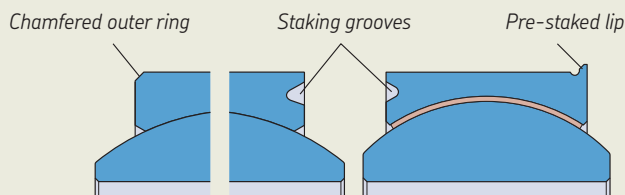
Figure 5



Rod end

Figure 6

### Outer ring designs





## Surface treatments or coatings

Surface treatments or coatings, including dry lubricants, can be used to adapt bearings to application requirements. The most common benefits of using surface treatments or coatings are:

- Prolonged bearing life
- Enhanced corrosion resistance
- Enhanced fretting resistance

## Seals or shields

SKF spherical plain bearings can be provided with shields or seals. Shields and seals are used to keep contaminants away from the sliding contact surfaces and, in the case of metal-to-metal bearings, to retain the grease in the sliding contact. Both effects can contribute to enhanced bearing performance.

## Customized bearings

SKF supplies customized bearings to meet specific airframe application requirements. These solutions are the result of SKF's extensive experience and close cooperation between SKF and the customer's application experts.

SKF provides total solutions over the full bearing life cycle, including design, testing and partnership.

For additional information, refer to *Customized products* **page 141** for metal-to-metal spherical plain bearings and **page 150** for self-lubricating spherical plain bearings

Contact your regional SKF partner via [www.skf.com/go/aero](http://www.skf.com/go/aero).

## Basic selection guidelines

Guidelines to select the most suitable bearing type are listed in **table 2**.

More detailed information about selecting spherical plain bearings is provided in *Metal-to-metal bearings* (**page 132**) and *Self-lubricating bearings* (**page 142**).

Table 2

### Basic selection guidelines

| Characteristic                                                          | Metal-to-metal<br>(Inner ring/outer ring material) |              | Self-lubricating |     |
|-------------------------------------------------------------------------|----------------------------------------------------|--------------|------------------|-----|
|                                                                         | Steel/steel                                        | Bronze/steel | Steel/bronze     |     |
| Performance under static loading conditions                             | +++                                                | ++           | +                | ++  |
| Performance under dynamic loading condition                             | ++                                                 | +++          | +++              | +++ |
| Wear resistance                                                         | +++                                                | ++           | ++               | +   |
| Seizing resistance                                                      | +                                                  | ++           | ++               | +++ |
| Corrosion resistance                                                    | ++                                                 | +++          | ++               | ++  |
| Performance in presence of contaminants with appropriate re-greasing    | ++                                                 | +++          | +++              | N/A |
| Performance in presence of contaminants in "maintenance-free" condition | +                                                  | +            | +                | ++  |
| High frequency oscillation and/or vibration                             | +                                                  | +            | +                | +++ |

**Symbols:** N/A = Not applicable    + = Moderate performance    ++ = Good performance    +++ = Very good performance

# Metal-to-metal spherical plain bearings

## Designs and variants

2

### Bearing designs

SKF can offer different designs of metal-to-metal spherical plain bearings, see **table 3**.

Key differences and selection criteria between the different metal-to-metal spherical plain bearing designs are listed in **table 4**.

### Bearing variants

According to the bearing design, different variants are available. Variants can be characterized by:

- Geometry: "light" (thin section), "narrow", or "wide"
- Function: "high load" or "high misalignment"

These variants can be combined with other variations and optional design features, like standard or reduced internal clearance, lubrication, surface treatments, as well as staking grooves or chamfers on the outer ring.

This allows spherical plain bearings to accommodate a wide range of application requirements (compactness, load carrying capability, swivelling angle) without requesting a customized bearing.

### Bearing series

Readily available bearing series are listed in **table 5** for metric dimensions and **table 6** for inch dimensions.

Table 3

| Bearing designs  | Figure                                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loader slot      |   | <ul style="list-style-type: none"> <li>• The first generation of metal-to-metal spherical plain bearings.</li> <li>• The outer ring has two slots in one side face. The slots are dimensioned larger than the inner ring.</li> <li>• The slots enable the inner ring to be easily mounted in the outer ring and to be easily dismounted.</li> <li>• The inner ring can also be mounted into a housing, such as a rod end body machined with slots. Refer to <i>Rod end</i> <b>page 280</b>.</li> <li>• Load carrying capability is reduced when load is applied in the direction of the slots.</li> </ul>                                                                                      |
| Swaged           |   | <ul style="list-style-type: none"> <li>• Swaging gives a spherical form to the outer ring by using the inner ring as the template. The outside diameter and the side faces of the outer ring are then re-machined.</li> <li>• This design provides more sizes and variants (including high-misalignment) compared to loader slot bearings.</li> <li>• The baseline for most of the international standards.</li> <li>• Limited material combinations are possible due to the swaging process. The outer ring material's ductility must allow for the swaging deformation while the inner ring hardness must sustain the swaging pressure. Refer to <i>Material</i> <b>page 138</b>.</li> </ul> |
| Split inner ring |  | <ul style="list-style-type: none"> <li>• Both inner and outer rings are machined. The inner ring is split in two parts. When mounted in the outer ring, there is a small gap between the two inner ring halves.</li> <li>• Enables the inner ring to be easily mounted in the outer ring and to be easily dismounted.</li> <li>• It is also possible to mount the split inner ring in a machined housing, such as a rod end body, a fitting or a shackle. Refer to <i>Customized products</i> <b>page 141</b>.</li> </ul>                                                                                                                                                                      |

Table 4

| Design/properties            | Loader slot                                                                         | Swaged                                                                                | Split inner ring                                                                      |
|------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                              |  |  |  |
| Load carrying capability     | High but reduced in the direction of the slots                                      | High                                                                                  | Very high                                                                             |
| Material combination options | All                                                                                 | Limited by swaging process                                                            | All                                                                                   |
| Other capabilities           | Easy mounting/dismounting of the inner ring                                         | High misalignment variant                                                             | Easy mounting/dismounting of the inner ring                                           |

Table 5

## SKF metal-to-metal spherical plain bearings, metric dimensions

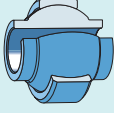
| Design           |                                                                                   | Variant           | Standard         | SKF series | Table number | Page |
|------------------|-----------------------------------------------------------------------------------|-------------------|------------------|------------|--------------|------|
| Loader slot      |  | EN                | EN 2336, EN 2588 | GE         | 2.1          | 156  |
|                  |                                                                                   | SKF               | –                | GL         | 2.2          | 160  |
|                  |                                                                                   | High load         | –                | GLS...RTG  | 2.3          | 164  |
|                  |                                                                                   | Wide              | –                | GT         | 2.4          | 166  |
| Swaged           |  | Light             | EN 2335          | MA         | 2.5          | 168  |
|                  |                                                                                   | Narrow            | –                | ME         | 2.6          | 172  |
|                  |                                                                                   | Wide              | –                | ML         | 2.7          | 176  |
|                  |  | High misalignment | –                | MT         | 2.8          | 180  |
|                  |                                                                                   |                   |                  |            |              |      |
| Split inner ring |  | SKF               | –                | 2 PL       | 2.9          | 182  |

Table 6

## SKF metal-to-metal spherical plain bearings, inch dimensions

| Design           |                                                                                     | Variant           | Standard               | SKF series | Table number | Page |
|------------------|-------------------------------------------------------------------------------------|-------------------|------------------------|------------|--------------|------|
| Loader slot      |  | Wide              | –                      | GT         | 2.10         | 184  |
| Swaged           |  | Narrow            | AS 21154, AS 21155     | ME         | 2.11         | 186  |
|                  |                                                                                     | Narrow            | EN 6046                | ENE        | 2.12         | 190  |
|                  |                                                                                     | Wide              | –                      | ML         | 2.13         | 194  |
|                  |                                                                                     | Wide              | EN 4265, EN 4266       | ENL        | 2.14         | 198  |
|                  |  | High misalignment | –                      | MT         | 2.15         | 202  |
|                  |                                                                                     | AS                | AS 81936/1, AS 81936/2 | QXMB       | 2.16         | 206  |
| Split inner ring |  | SKF               | –                      | 2 PL       | 2.17         | 210  |

# Bearing selection process

## Selecting bearing size and options

If you are looking for a known bearing, according to its standard for example, or if you are an experienced bearing expert, use **tables 5 and 6, page 133** to find the relevant bearing table.

For help in selecting the appropriate bearing size and options, follow these steps:

- 1 Determine the range of allowable interface dimensions for the bearing. Often the boundary dimensions are predetermined by the space available on the aircraft system. Typically, the shaft diameter determines the bearing's bore diameter.
- 2 Determine the static radial and axial loads requirements. For more information refer to **Load carrying capability page 134**.
- 3 Determine the required swivelling angle.
- 4 From the product tables find a bearing design and series with sufficient static load carrying capability and swivelling angle capability that best fits the required dimensions.

### Example

An inch bearing for high misalignment is needed. **Table 6** suggests MT series on **page 202**. For a maximum outside diameter of 25,4 mm and a static radial load capacity of 55 kN, MT9.52 can be selected.

- 5 Depending on the operating and loading conditions (static or dynamic) select the appropriate material combination. As specified in **table 2** for metal-to-metal spherical plain bearings:
  - Bronze/steel or steel/bronze bearings are typically used for dynamic applications with rotational or swivelling movement. For motion in bore, select a bronze inner ring.
  - Steel/steel bearings are typically used for static or dynamic application with low rotational or swivelling motion during life.

For more information, refer to **Load carrying capability page 134**.

- 6 Choose all other required options, including **Lubrication (page 137)**, **Surface treatments (page 139)**, **Internal clearance (page 136)**, **Sealing and shielding (page 140)**, **Dismounting and Oversized dimensions (page 155)**, **Staking grooves and mounting condition (pages 130 and 154)**.

If the standard SKF range of metal-to-metal spherical plain bearings does not meet your specific needs, contact SKF for a customized design solution, as described in **Customized products page 141**

## Load carrying capability

### Radial and axial static limit load

The static limit load of a bearing is the maximum permissible static operational load that the bearing can withstand without permanent deformation and without loss of bearing functionality or performance.

The static limit loads listed in the product tables are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, consider the following reductions:

- Bronze outer ring
  - Static limit loads are 60% of the equivalent steel/steel bearing
- Bronze inner ring
  - Static limit loads are 90% of the equivalent steel/steel bearing
- Lubrication grooves
  - The static limit loads are slightly reduced. Contact SKF for further information

In case of combined loads (both axial and radial), each component should be analyzed separately, see **figure 7**.

**NOTE:** For loader slot bearings, the static limit loads listed in the relevant product tables are only valid when the load is not applied in the direction of the slots, see **figure 8**.

Figure 7

#### Bearing radial and axial loads

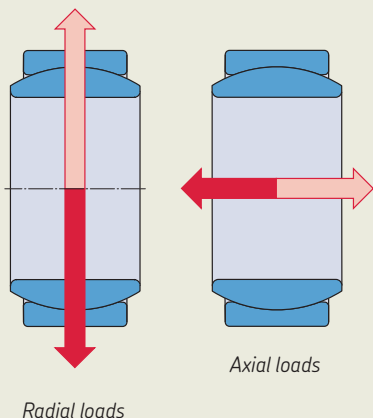
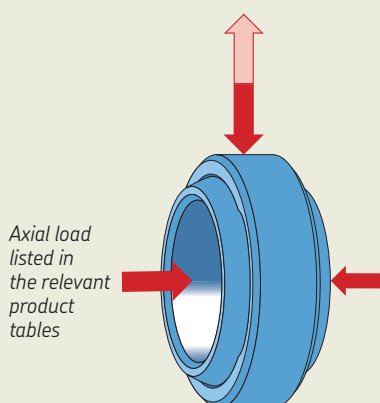


Figure 8

#### Loader slot bearing radial and axial loads



### Ultimate static loads

The ultimate load is the highest load the bearing can support without any fracture, failure or inner ring push-out. It is defined as 1,5 times the corresponding radial or axial static limit load.

Spherical plain bearings exposed to this load level are no longer guaranteed to be fully functional and should be replaced.

### Dynamic load rating

Metal-to-metal spherical plain bearings can support fatigue and endurance dynamic loading.

- Fatigue dynamic loading is when the load is alternating with no imposed swivelling or rotational movement
- Endurance dynamic loading is when the load is applied constantly or alternating with swivelling and/or rotational movement, see **figure 9**.

SKF's metal-to-metal spherical plain bearing can accommodate different dynamic loading conditions depending on the sliding contact surface combinations, as described in **table 7**.

Bearing end-of-life criteria can be:

- Seizing of the bearing
- The maximum allowable internal clearance limit for the application is reached due to wear

The bearing should be replaced when one of the above limits is reached.

For a unidirectionally loaded application, the wear on one bearing surface equates to bearing internal clearance. For a reversing load application, wear occurs on two surfaces and the sum equates to the bearing internal clearance. See **figure 10**.

Wear rate and risk of seizing depend on the lubrication and relubrication conditions, refer to *Lubrication* **page 137**. They can be increased due to operation in harsh environmental conditions such as exposure to solid contamination with sand and dust.

In these cases, consider using sealing or shielding solutions (*Sealing and shielding* **page 140**).

SKF can also provide surface treatments to extend bearing dynamic life by improving contact conditions and thus delaying wear and seizing (*Surface treatments* **page 139**).

Figure 9

#### Bearing motion in endurance

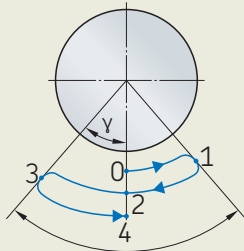
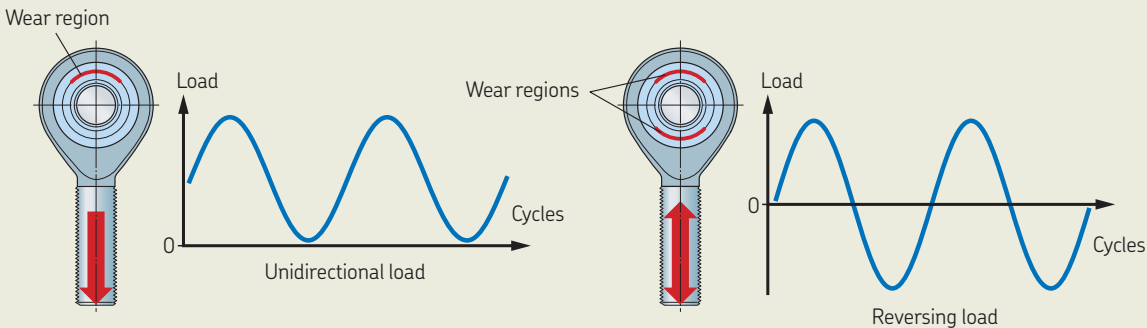


Table 7

| Sliding contact surface combinations<br>(Inner ring/outer ring) | Typical dynamic loading condition                                                                                        |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Steel/steel                                                     | <ul style="list-style-type: none"> <li>• Fatigue</li> </ul>                                                              |
| Steel/bronze                                                    | <ul style="list-style-type: none"> <li>• Fatigue</li> <li>• Endurance at low frequency</li> </ul>                        |
| Bronze/steel                                                    | <ul style="list-style-type: none"> <li>• Fatigue</li> <li>• Endurance at low frequency</li> <li>• Bore motion</li> </ul> |

Figure 10

#### Bearing loading condition and wear regions



## Internal clearance

Bearing internal clearance is defined as the total distance through which one bearing ring can be moved relative to the other (**figure 11**) under a defined measuring load (**table 8**) according to the relevant standard. It can be measured in the radial direction (radial internal clearance) or in the axial direction (axial internal clearance).

**NOTE:** For loader slot bearings, radial internal clearance is not measured in the direction of the slots.

Internal clearance is needed for metal-to-metal spherical plain bearings to function properly and to enable a uniform lubrication film to be formed in the spherical contact.

Standard metal-to-metal spherical plain bearings can be supplied with standard or reduced internal clearance.

Reduced internal clearance is suitable when the following application requirements need to be fulfilled :

- Low noise and vibration level
- High stiffness of the system
- A low end-of-life clearance when operating under dynamic conditions

Radial and axial clearance values are listed in the relevant product tables.

The initial internal clearance can be impacted by:

- Mounting conditions. Refer to *Mounting* **page 153**
- Thermal expansion of the bearing rings and associated components

These effects must be considered when selecting the initial internal clearance.

Figure 11

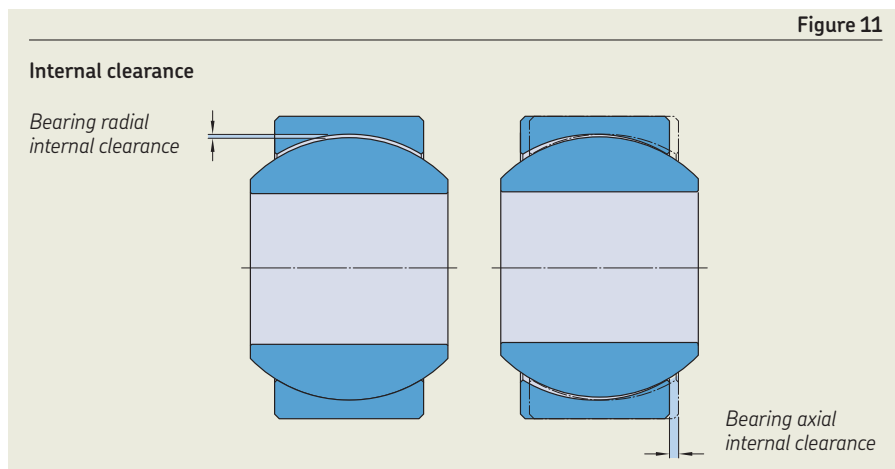


Table 8

| Measuring loads for internal clearance measurements |           |           |
|-----------------------------------------------------|-----------|-----------|
| Bearing series                                      | d ≤ 20 mm | d > 20 mm |
| To AS standard                                      | 25 N      | 25 N      |
| To EN standard                                      | 50 N      | 100 N     |
| Other series                                        | 50 N      | 100 N     |

Table 9

| Standard greases |                      |                                     |
|------------------|----------------------|-------------------------------------|
| NATO codes       | Standard             | Operating temperature               |
| G395             | MIL PRF 81322        | −54 to +177 °C<br>(−64 to +350 °F)  |
| G354             | MIL PRF 23827 type I | −73 to +121 °C<br>(−100 to +250 °F) |
| G353             | MIL G 21164          | −73 to +121 °C<br>(−100 to +250 °F) |

## Lubrication

Metal-to-metal spherical plain bearings are supplied greased, ready to be put into operation.

They can be:

- Greased-for-life  
This is especially suitable for static and fatigue loading conditions.
- Relubricated periodically  
This is especially suitable for endurance conditions. To facilitate this operation, lubrication holes and grooves can be provided, refer to *Lubrication grooves* **page 137**. For optimum bearing performance, relubrication should be performed frequently, for instance, during aircraft planned maintenance.

Refer to *Load carrying capability* **page 134** for more information about static, fatigue and endurance bearing performance with respect to lubrication.

Lubrication helps to:

- Reduce friction
- Reduce wear rate
- Reduce seizing risk
- Extend bearing service life
- Protect against corrosion
- Expel contaminants and wear debris

### Lubricants

The greases used for standard metal-to-metal spherical plain bearings are listed in the relevant product tables. **Table 9** gives the different designations, reference standards and operating temperatures for these greases.

Lubrication is primarily chosen according to the operating temperature, refer to **table 9**, **page 136** for more information.

**WARNING:** To prevent risk of bearing failure, use the same lubricant as supplied when relubricating.

## Lubrication grooves

To facilitate lubricant supply to the sliding surfaces, metal-to-metal spherical plain bearings requiring periodic relubrication are available with relubrication grooves and holes in either the inner ring, the outer ring, or both rings (**figure 12**). Available options are listed in the relevant product tables.

Selection should be made according to the grease input locations in the housing or shaft:

- For grease inputs in the housing, select code C or Y
- For grease inputs in the shaft, select code S or Y
- For grease inputs in both the shaft and housing, select code Y

Refer to **figures 13** and **14** for examples.

Figure 12

### Lubrication grooves

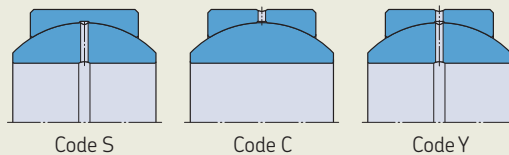


Figure 13

### Relubrication via the outer ring

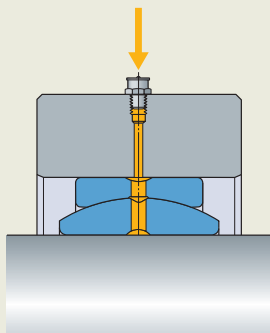
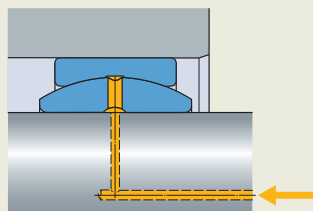


Figure 14

### Relubrication via the inner ring



## Operating temperature

The permissible operating temperature of standard metal-to-metal spherical plain bearings is limited by the grease capability (**table 9, page 136**).

For operation outside this temperature range, standard bearing life and performance may be reduced. Contact SKF for more information.

A wider operating temperature range can be achieved by using dry lubricants (refer to *Dry lubricants* **page 139**) or *Customized products* (refer to *Customized products* **page 141**).

go/aero and refer to *Customized products* **page 141**.

### Loader slot spherical plain bearings

Standard loader slot spherical plain bearings can be made of :

- Bearing steel (No code)
- Corrosion-resistant steel (Code W)
- Bronze beryllium for the inner ring and bearing steel for the outer ring (Code Q)

**Table 10** gives the different designations, reference standards and key characteristics for these materials.

### Swaged spherical plain bearings and bearings with a split inner ring

The sliding contact surfaces of standard swaged spherical plain bearings and bearings with a split inner ring are manufactured in different material combinations as shown in **figure 15**.

Selection is to be made according to operating conditions, refer to *Bearing selection process* **page 134**.

- Inner ring: corrosion-resistant steel 440C (codes W and WQ) or bronze beryllium (code Q)
- Outer ring: corrosion-resistant steel 17-4PH (codes W and Q) or bronze aluminium (Code WQ)

**Table 11** gives the different designations, reference standards and key characteristics for these materials.

## Bearing data

### Material

SKF metal-to-metal spherical plain bearings are primarily available in the following materials:

- Bearing steel, for high strength
- Corrosion-resistant steel, for high strength and good corrosion resistance
- Copper alloys (bronze materials), for good corrosion resistance and enhanced dynamic performance (refer to *Dynamic load rating* **page 135**)

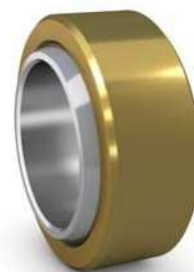
Depending on bearing design, inner and outer rings can be selected in different material combinations, as follows.

SKF can offer many other material combinations. Contact SKF at [www.skf.com/](http://www.skf.com/)

Standard material combinations



Code W  
steel/steel



Code WQ  
steel/bronze



Code Q  
bronze/steel

Figure 15

Table 10

#### Standard materials for loader slot bearings

| Steel type                | Corrosion resistance | Hardness HRC                                                       | Material designation | EN standards | AMS standards           | Equivalent designation   |
|---------------------------|----------------------|--------------------------------------------------------------------|----------------------|--------------|-------------------------|--------------------------|
| Bearing steel             | Moderate             | For IR <sup>1)</sup> = 60 to 63<br>For OR <sup>2)</sup> = 58 to 62 | 52100                | EN 2031      | AMS 6440 or<br>AMS 6444 | 100Cr6<br>(100C6)        |
| Corrosion-resistant steel | Good                 | For IR <sup>1)</sup> = 55 to 62<br>For OR <sup>2)</sup> = 58 to 61 | 440C                 | EN 2030      | AMS 5630 or<br>AMS 5618 | X105CrMo17<br>(Z100CD17) |
| Bronze beryllium          | Very good            | ≥ 37                                                               | CuBe 1.9             | –            | AMS 4533 or<br>AMS 4535 | –                        |

1) IR means inner ring

2) OR means outer ring.



## Surface treatments

Spherical plain bearings can be exposed to various environmental conditions including humidity, heat and contamination. These can increase the risk of corrosion, wear and seizing.

Therefore, SKF supplies spherical plain bearings with standard surface treatments including:

- Zinc-nickel or cadmium<sup>1)</sup> plating on the outer ring external surfaces, typically used to enhance corrosion resistance and/or fretting resistance
- Chromium plating<sup>1)</sup> or SKF's chromium replacement coating (XCR) in the spherical contact, typically used to enhance corrosion resistance and/or dynamic performance. SKF's XCR surface treatment is free from chromium 6 compounds and has equivalent performance in comparison to chromium plating

- Corrosion-resistant steel inner rings can be passivated as required per the relevant standards

Surface treatments for SKF metal-to-metal spherical plain bearings are applied according to the following standards:

- Passivation according to AMS 2700 or ISO 8075
- Cadmium plating<sup>1)</sup> according to AMS-QQ-P-416 or AMS03-19<sup>2)</sup>
- Zinc-nickel plating according to AMS 2417
- Hard chromium plating<sup>1)</sup> according to AMS 2460<sup>3)</sup>

The bearing interface dimensions and tolerances from product tables are not modified when surface treatments are used.

For specific surface treatments, refer to the *Customized products* **page 141**.

## Dry lubricants

Dry lubricants such as MoS<sub>2</sub> or graphite lubricants can be used:

- When required by the relevant standards
- For improved fatigue performance including fretting resistance
- To extend the operating temperature range of SKF metal-to-metal spherical plain bearings. Dry lubricants can be used at temperatures above the range of standard greases. Depending on the dry lubricant, temperatures up to 260 °C (500 °F) can be accommodated. The bearing design and materials must be suitable for the temperature range of the application. For detailed information contact SKF and refer to *Customized products* **page 141**.

<sup>1)</sup> Treatment includes chromium 6 compounds and may be subject to environmental legislation

<sup>2)</sup> Formerly DEF STAN 03-19

<sup>3)</sup> Formerly AMS QQ-C-320

Table 11

### Standard materials for swaged bearings and bearings with a split inner ring

| Material type             | Bearing type          | Corrosion resistance | Hardness HRC                                                                                                | Material designation | EN standards       | AMS standards        | Equivalent designation |
|---------------------------|-----------------------|----------------------|-------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|------------------------|
| Corrosion-resistant steel | Swaged and split      | Good                 | For EN series = 55 to 62<br>For AS series ≥ 56<br>For other series ≥ 58                                     | 440C                 | EN 2030            | AMS 5630 or AMS 5618 | X105CrMo17 (Z100CD17)  |
|                           | Swaged                | Very good            | For AS 21154 and AS 21155 series = 27 to 36<br>For inch EN series = 28 to 38<br>For other series = 28 to 37 | 17-4PH H1150         | EN 2539 or EN 3161 | AMS 5643             | Z6CNU17.04 H1150       |
|                           | With split inner ring | Very good            | 34 to 42                                                                                                    | 17-4PH H1025         | EN 2539 or EN 3161 | AMS 5643             | Z6CNU17.04 H1025       |
| Bronze Beryllium          | Swaged and split      | Very good            | ≥ 37                                                                                                        | CuBe 1.9             | –                  | AMS 4533 or AMS 4535 | –                      |
| Bronze aluminium          | Swaged and split      | Very good            | No standard requirement                                                                                     | CuAl10Ni5Fe4         | –                  | AMS 4640             | –                      |

## Dimensions and tolerances

Relevant interface dimensions and tolerances are listed in the product tables.  
Where:

$\Delta d_{mp}$  = Single plane mean bore diameter deviation

$\Delta D_{mp}$  = Single plane mean outside diameter deviation

**Figure 16**, top figure, shows measurement definitions for a single plane mean diameter deviation.

And

$\Delta d_s$  = Deviation of a single bore diameter

$\Delta D_s$  = Deviation of a single outside diameter

**Figure 16**, bottom figure, shows measurement definitions for the deviation of a single diameter.

For more information about the measurement principle of interface dimensions and tolerances, refer to ISO 1132.

## Sealing and shielding

Most spherical plain bearings can be supplied with seals (codes TT, E or EE) or shields (code PP). Refer to the relevant product tables, see **figure 17**.

Seals and shields protect the spherical contact area against solid contaminants such as dust or sand. Seals should be considered in environments with high contamination. They can also protect against liquid contaminants such as hydraulic fluids or de-icing liquids.

The shields are fixed on the outer ring and are in close contact with the inner ring spherical surface. For sealed versions, seals are pressed between shields and the inner ring spherical surface.

For customized sealing and shielding solutions, refer to *Customized products* **page 141**.

The geometrical, physical and mechanical characteristics of the sealed and shielded spherical plain bearings are identical to those of non protected bearings, except:

- The life under dynamic load in contaminated environments can be increased significantly
- The torque, especially for sealed bearings, can be increased
- The swivelling angle is reduced by 2 to 4° depending on the bearing type

**Figure 16**

### Dimensional tolerances measurement principle

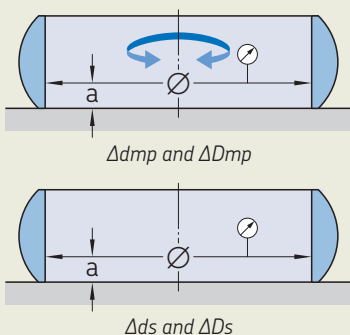
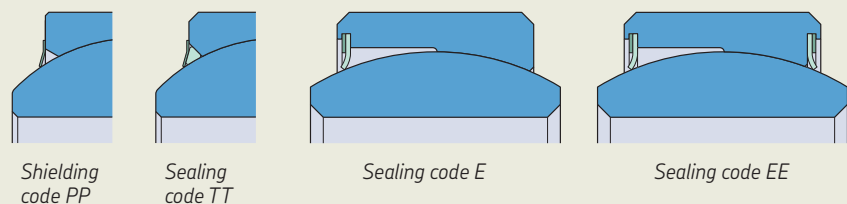


**Figure 17**

### Standard sealing and shielding solutions



# Customized products

SKF designs and manufactures customized metal-to-metal spherical plain bearings to meet customer-specific application requirements.

Examples can include, but are not limited to:

- **Specific dimensions, clearances and geometries**
- **Materials**
  - Alternative steel and corrosion-resistant steel alloys such as 15-5PH per AMS 5659 or other, or PH13.8 per AMS 5629 or other.
  - Alternative bronze alloys, especially for highly demanding dynamic operating conditions
  - High temperature materials such as nickel or cobalt alloys
  - Coated titanium alloys for lightweight solutions
- **Surface treatments**

Including:

  - Silver plating
  - PVD

Certain treatments include chromium 6 compounds and may be subject to environmental legislation
- **Alternative lubricants and dry lubricants**

## Function Typical SKF customized solutions

### Mounting and axial stops



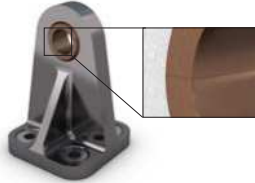
*Screwed flange*



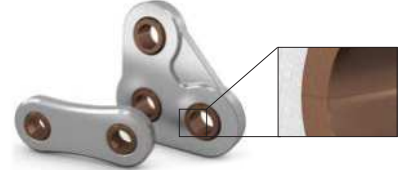
*Nut and washer*



*Pre-staked*



*Fitting design*



*Shackle design. For multi bearing interfaces*

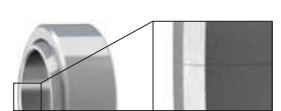
### Geometries and designs



*Split outer ring*



*Inner rings supplied on their own*

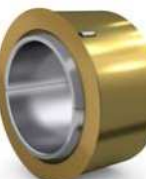


*Split inner ring, no gap*

### Rotation and swivelling stops

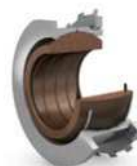


*Bump stops*



*Pin*

### Sealing and lubrication



*Specific lubrication groove designs and sealing features to optimize bearing protection, lubrication and relubrication, even under load:*

- Extend bearing life
- Extend relubrication intervals
- Allow for larger motions
- Use of grease nipple solutions to allow relubrication without holes or grooves in housing and shaft

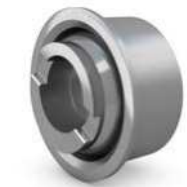
### Improved motion in bore



*Sleeve*



*Liner in bore*



*Counterbore, pockets, notches*

# Self-lubricating spherical plain bearings

2

SKF self-lubricating spherical plain bearings use a PTFE-based liner bonded to the outer ring spherical surface. The liner system provides lubrication for the lifetime of the bearing. No additional lubrication is used. This is why these bearings are often referred to as "maintenance-free".

**WARNING:** Self-lubricating spherical plain bearing must not be lubricated. This may result in damage to the liner and reduced bearing performance.

For self-lubricating spherical plain bearings operating under load and oscillation condition, some PTFE material is transferred from the liner to the inner ring surface creating a third body, enabling low wear and low friction sliding. The PTFE transfer results in a reduction in the thickness of the liner by wear and an increase in the bearing internal clearance. Refer to *Bearing life* **page 145**.

## Designs and variants

The standard assortment of SKF self-lubricating spherical plain bearings comprises:

- Chamfered or grooved outer ring, depending on mounting conditions. Refer to *Mounting chapter* **page 153**. Grooved outer rings can have a pre-staked lip or not
- Variations in boundary dimensions: "light" (thin section), "narrow" and "wide" variants
- Variants with different functions: "high misalignment" and "controlled clearance" variants

Standard self-lubricating bearings are swaged. Swaging gives a spherical form to the outer ring by using the inner ring as the template. The outside diameter and the side faces of the outer ring are then re-machined. Material combination options are limited due to the swaging process. The outer ring material's ductility must allow for the swaging deformation while the inner ring hardness must sustain the swaging pressure. For more information, refer to *Material* **page 148**.

## Bearing selection process

### Selecting bearing size and options

If you are looking for a known bearing, according to its standard for example, or if you are an experienced bearing expert, use **tables 12** and **13** to find the relevant bearing.

For help in selecting the appropriate bearing size and options, follow these steps:

- 1 Determine the range of allowable interface dimensions for the bearing. Often the boundary dimensions are predetermined by the space available on the aircraft system. Typically, the shaft diameter determines the bearing bore diameter.
- 2 Determine the static radial and axial load requirements. For more information refer to *Load carrying capability* **page 144**.
- 3 Determine the required swivelling angle.

- 4 From the product tables, find a bearing design and series with sufficient static load carrying capability and swivelling angle capability that best fits the required dimensions.

– For example, for high misalignment bearings, select XRT series. For a maximum bearing size of 25,4 mm with a static radial load capacity of 55 kN, then XRT9,52 can be selected.

- 5 If the bearing operates under dynamic conditions, compare the application loading conditions to the bearing dynamic loads listed in the relevant product table to select the appropriate bearing series and size. Refer to *Dynamic load carrying capability and bearing life* **page 144**.
- 6 Choose all other required options, including Surface treatments (**page 149**), Friction and torque (**page 146**), Internal clearance (**page 147**), Sealing and shielding (**page 149**), Dismounting and Oversized dimensions (**page 155**), Staking groove and mounting condition (**pages 130** and **154**).

If the standard SKF range of self-lubricating spherical plain bearings does not meet your specific needs, contact SKF for a customized design solution, as described in *Customized products* **page 150**.

Table 12

## Self-lubricating spherical plain bearings, metric dimensions

| Figure                                                                            | Variant           | Standard         | SKF series | Table number | Page |
|-----------------------------------------------------------------------------------|-------------------|------------------|------------|--------------|------|
|  | Light             | EN 3048, EN 4037 | LEN..      | 2.18         | 214  |
|                                                                                   | Narrow            | EN 2584, EN 4038 | NEN..      | 2.19         | 216  |
|                                                                                   | Wide              | EN 2585, EN 4039 | WEN..      | 2.20         | 220  |
|  | High misalignment | EN 4040          | HMEN..     | 2.21         | 224  |
|                                                                                   | High misalignment | –                | XRT..      | 2.22         | 226  |
|  | Pre-staked        | –                | XRL..FR    | 2.23         | 228  |

Table 13

## Self-lubricating spherical plain bearings, inch dimensions

| Figure                                                                              | Variant                     | Standard               | SKF series | Table number | Page |
|-------------------------------------------------------------------------------------|-----------------------------|------------------------|------------|--------------|------|
|   | Narrow controlled clearance | –                      | SN..ZT     | 2.24         | 230  |
|                                                                                     | Narrow                      | NSA 8134, NSA 8136     | SN..       | 2.25         | 232  |
|                                                                                     | Narrow                      | AS 14101, AS 14104     | NAS..      | 2.26         | 236  |
|                                                                                     | Narrow lined bore           | AS 81820/1, AS 81820/4 | NAS..A..   | 2.27         | 240  |
|                                                                                     | Wide                        | NSA 8135, NSA 8137     | SW..       | 2.28         | 244  |
|                                                                                     | Wide                        | AS 14102, AS 14103     | WAS..      | 2.29         | 248  |
|                                                                                     | Wide lined bore             | AS 81820/2, AS 81820/3 | WAS..A..   | 2.30         | 254  |
|  | High misalignment           | –                      | SH..       | 2.31         | 256  |
|                                                                                     | High misalignment           | –                      | 11..H..    | 2.32         | 258  |
|                                                                                     | High misalignment           | –                      | XRT..      | 2.33         | 260  |
|  | Pre-staked                  | –                      | XRL..FR    | 2.34         | 264  |

## Load carrying capability

SKF bearings have been tested in accordance with AS 81820 (Technical specification for bearings, plain, self-aligning, self-lubricating, low speed oscillation) and EN 2755 (Aerospace series, bearings, spherical plain in corrosion-resisting steel with self-lubricating liner – elevated load at ambient temperature – technical specification). They meet the requirements of static load, deflection and permanent set, and all dynamic wear limits.

The ultimate stress levels of SKF lining materials in compression are greater than the yield stress of the corrosion-resistant steel normally used as inner and outer ring materials. Due to the strength of the inner ring material being higher than that of the outer ring material in standard swaged bearings, the static loads are determined by the strength of the outer ring material and liner contact area.

### Static limit load

The static limit load of a bearing is the maximum permissible static operational load that the bearing can withstand without permanent deformation and loss of capability. The static limit loads as listed in the product tables are in conformance with the associated standard that they are designed to (AS or EN).

#### Static radial limit load

The approximate radial static limit load,  $C_s$  can be calculated using:

$$C_s = \frac{2}{3} \sigma_{\text{yield}} A_r$$

Where:

- $C_s$  Radial static limit load [N/lbf]
  - $\sigma_{\text{yield}}$  Outer ring yield stress [MPa/psi]
  - $A_r$  Radial projected area [mm<sup>2</sup>/in<sup>2</sup>]
- (table 14)

#### Static axial limit load

The approximate axial static limit load,  $C_a$  can be calculated using:

$$C_a = \frac{1}{3} \sigma_{\text{yield}} A_a$$

Where:

- $C_a$  Axial static limit load [N/lbf]
  - $\sigma_{\text{yield}}$  Outer ring yield stress [MPa/psi]
  - $A_a$  Axial projected area [mm<sup>2</sup>/in<sup>2</sup>]
- (table 14)

In case of combined loads (both axial and radial), each component should be analysed separately.

### Ultimate static load

The ultimate static load is the highest load the bearing assembly can support without any fracture, failure or inner ring push-out. It is defined as 1,5 times the corresponding permissible radial or axial static limit load.

Spherical plain bearings loaded at this level are no longer guaranteed to be fully functional and should be replaced.

## Dynamic load carrying capability and bearing life

Self-lubricating spherical plain bearings can support fatigue or endurance dynamic loading.

- Fatigue dynamic loading is when the load is alternating with no imposed swivelling or rotational movement
- Endurance dynamic loading is when the load is applied constantly or alternating, with swivelling and/or rotational movement

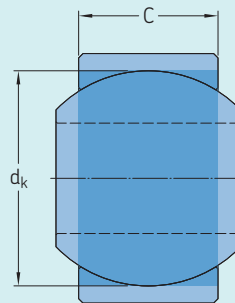
The dynamic load carrying capability listed in the relevant product tables corresponds to standard operational cases as defined in the aeronautical standards AS 81820 and EN 2755 with the following parameters:

- Unidirectional radial load
- Room temperature
- Rotation:  $\pm 25^\circ$  (100° total per cycle). See **figure 18**, with  $\gamma = 25^\circ$
- Duration: 25 000 cycles
- Speed: 10 cycles per minute

Table 14

#### Projected area Direction

##### Radial

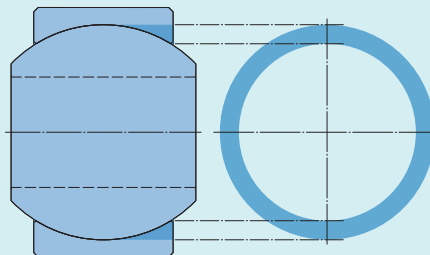


$$A_r = d_k(C - 1,6)$$

Where:

- $A_r$  Radial area [mm<sup>2</sup>]
- $d_k$  Spherical diameter [mm]
- $C$  Outer ring width [mm]

##### Axial



$$A_a = \pi \left( \left( \frac{d_k}{2} \right)^2 - \left( \left( \frac{d_k}{2} + t \right)^2 - \left( \frac{C}{2} - l_r \right)^2 \right) \right)$$

Where:

- $A_a$  Axial area [mm<sup>2</sup>]
- $d_k$  Spherical diameter [mm]
- $C$  Outer ring width [mm]
- $t$  Liner thickness, typically 0,3 [mm]
- $l_r$  Liner recess, typically 0,5 [mm]

The C25 dynamic load carrying capability is valid for bearings without inner ring surface coatings.

In most airframe applications, the operating dynamic load can be much lower than the bearing dynamic load carrying capability listed in the relevant product tables. This results in significantly lower operating bearing pressures than the standard C25 test case and therefore significantly increased expected bearing life.

Refer to *Bearing life* **page 145** and *Surface coating* **page 148** for more information about bearing end of life criteria and SKF coatings used for increased bearing life.

### Bearing life

Typically, fatigue life is not the limiting factor for self-lubricating spherical plain bearings.

Self-lubricating spherical plain bearings operating under endurance loading conditions will have wear (**figure 19**) that increases the bearing internal clearance.

Bearing endurance life is determined by two criteria:

- The maximum allowable internal clearance limit
- The limit of usable liner thickness: a maximum wear depth per surface is used in life calculations

The bearing should be replaced when one of the above limits is reached.

For a unidirectionally loaded application, the wear on one liner surface equates to bearing internal clearance. For a reversing load application, wear occurs on two surfaces and the sum equates to the bearing internal clearance. See **figure 20**.

SKF can offer surface treatments applied to the inner ring spherical surface, adapted to enhance endurance life by improving contact conditions and thus reducing wear. For more information, refer to *Surface coating* **page 148**.

### Influence of operational conditions

The bearing life of self-lubricating spherical plain bearings depends on many factors and can be reduced by:

- Increased operational load
- Increased angular oscillation and combination of rotation and swivelling
- Increased operational speed (frequency)
- Operating temperatures out of the range of  $-20$  to  $+80$  °C ( $-4$  to  $+176$  °F). Outside this range, the wear rate increases. For more information, refer to *Operating temperature* **page 147**.
- Environmental conditions including contamination such as exposure to liquid contaminants (fuel, hydraulic fluids or de-icing liquid)
- Excessive interference fitting conditions

Contact SKF for detailed calculations associated with specific operating conditions.

Figure 18

#### Oscillation angle $\gamma$

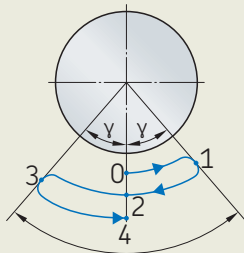
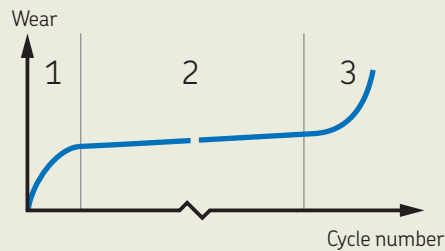


Figure 19

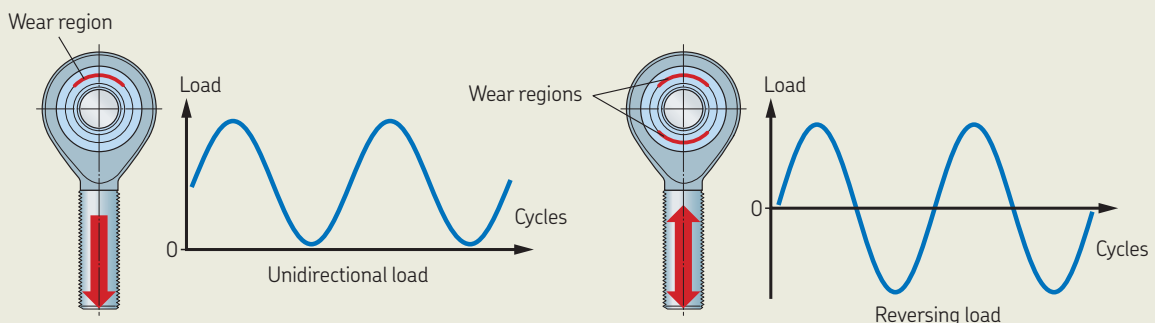
#### Bearing wear rate



- 1 Running-in phase  
Decreasing wear rate
- 2 Normal operation  
Low constant wear rate
- 3 Final wear phase  
Accelerating wear rate

Figure 20

#### Bearing loading condition and wear regions



# Friction and torque

## Unloaded torque

Self-lubricating spherical plain bearings are designed and supplied with zero clearance and defined starting torques, except for the controlled clearance variant (in this case, refer to *Internal clearance* **page 147**).

For airframe self-lubricating spherical plain bearings, performing oscillation movements or a low number of complete rotations, the starting torque is a relevant design parameter. This is defined as the maximum torque required to start the rotation of one ring with the other one held stationary. This torque is measured without load applied on the bearing and after several rotational and swivelling motions have initially been made. For influence of load on torque, refer to *Loaded frictional moment* **page 146**.

SKF self-lubricating spherical plain bearings are produced with standard or reduced torques in accordance with the relevant product standards. The starting rotational torque or the rotational frictional moment for each bearing are defined in the relevant product tables.

The unloaded torque is not constant over time, with a starting torque higher than the bearing rotational frictional moment, also called dynamic rotational torque. This is due to the initial resistance to rotation that the bearing has to overcome before starting the rotation at the sliding contact interface (**figure 21**).

Sealing and shielding solutions increase the torque, as seals and shields make contact with the inner ring of the bearing. Refer to *Sealing and shielding* **page 149**.

The mounting conditions can influence the bearing unloaded torque. Refer to *Mounting* **page 153**.

Where specific installation requirements are necessary, it is possible to produce bearings with lower or higher starting torque than standard. Higher starting torques can be suitable for applications where greater operational stiffness is required.

Contact SKF for customized solutions and refer to *Customized products* **page 150**.

## Loaded frictional moment

An estimate of the loaded rotational frictional moment at operational loads can be calculated using the following formula:

$$T = \mu F r$$

Where:

$T$  = Loaded rotational frictional moment

[Nmm/lbin] 1 Nmm = 0,001 Nm

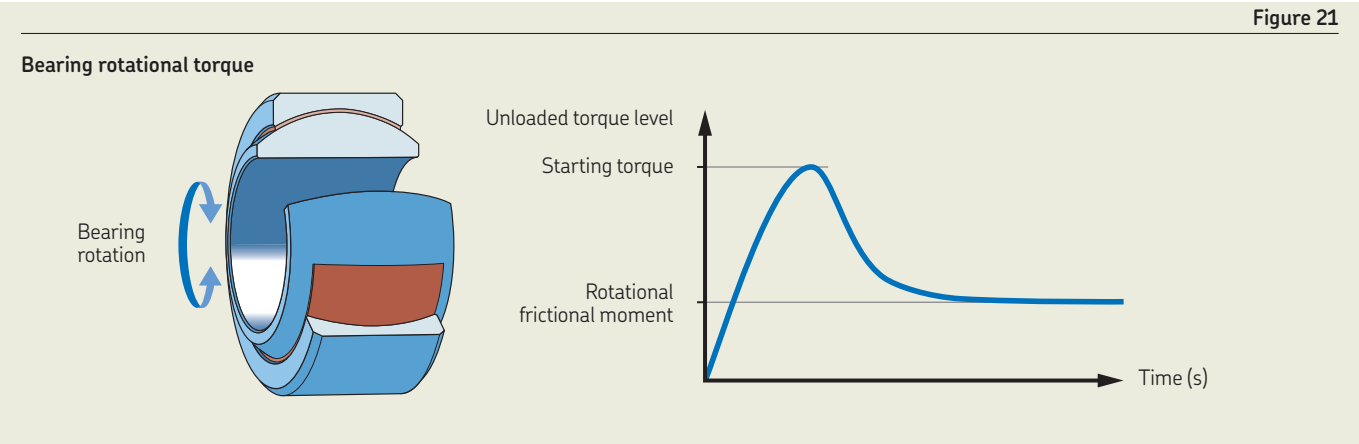
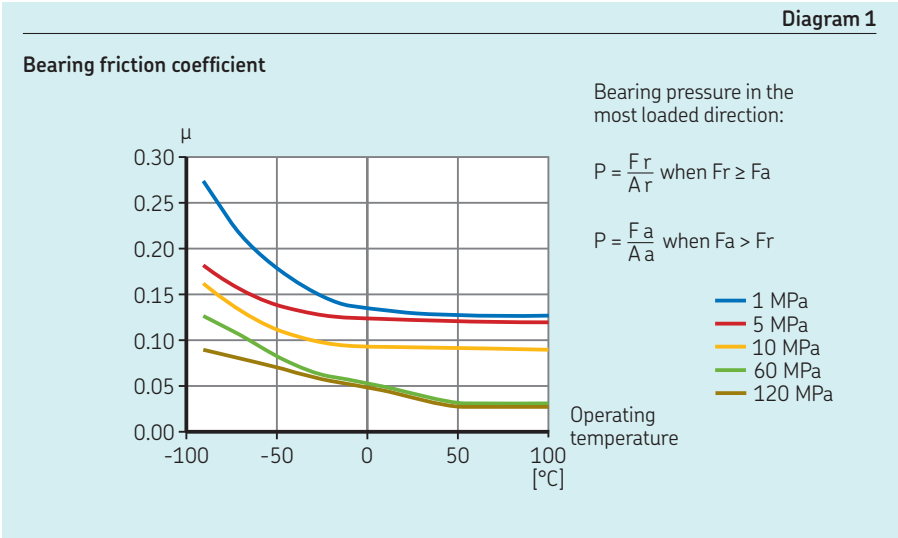
$\mu$  = Friction coefficient

$F$  = Radial load [N/lb]

$r$  = Half of the lined diameter,  $d_k/2$  for spherical plain bearings [mm/in]

Approximate bearing friction coefficient as a function of operating conditions (temperature and pressure) can be estimated from **diagram 1**.

Frictional properties remain mostly constant over the operational wear thickness of the liner.





## Internal clearance

SKF also supplies bearings with:

- Reduced torque resulting in a very small level of clearance within the bearing
- No torque and controlled clearance. This is typically used where specific installation requirements with high interference fit with the housing are necessary. This clearance will then be removed when under load or assembled into the application. Refer to *Controlled clearance bearing variants*. See **figure 22**.

Bearing clearance can be impacted by mounting conditions. Refer to *Mounting* **page 153**.

## Operating temperature

### Installation

For the purpose of installation by temperature difference, self-lubricating spherical plain bearings can be immersed in liquid nitrogen at  $-193\text{ }^{\circ}\text{C}$  ( $-315\text{ }^{\circ}\text{F}$ ). This is an established practice with no detrimental effect on the bearing.

### Operation

Standard SKF self-lubricating spherical plain bearings are designed and tested to operate in the temperature range of  $-55$  to  $+163\text{ }^{\circ}\text{C}$  ( $-67$  to  $+325\text{ }^{\circ}\text{F}$ ), according to the requirements of AS 81820 and EN 2755.

The full operating temperature range of standard self-lubricating spherical plain bearings is  $-193$  to  $250\text{ }^{\circ}\text{C}$  ( $-315$  to  $+482\text{ }^{\circ}\text{F}$ ). Note that throughout the temperature range, due to the PTFE lubricant in the liner, temperature impacts the wear rate and therefore bearing life.

This impact must be assessed against the function of the bearing (contact SKF). Key parameters include:

- Oscillation type (rotation and/or swivelling).
- Large or small motion angle
- High or low speed
- Percentage time at temperature

Refer to *Bearing life* **page 145**. Contact SKF for operation outside these conditions or for customized bearings.

The relevant temperature ranges are shown in **figure 23** using the SKF traffic light concept.

### Effect of thermal expansion

Due to the relatively thin layer of the liner, the coefficient of thermal expansion of the liner may be regarded as being identical to that of the bearing ring.

When selecting a bearing, the materials of the housing and shaft must also be considered as differing coefficients of thermal expansion can modify both assembled fit and bearing torque.

Figure 22

### Bearing with controlled clearance

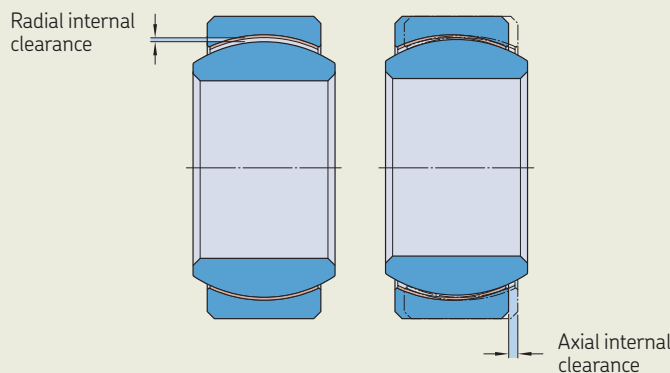


Figure 23

### Bearing operating temperature range



Do not use

Operation permissible. Impact on bearing life, contact SKF.

Qualified range of operating temperature.



# Bearing data

## Material

SKF standard self-lubricating spherical plain bearings are primarily available in corrosion-resistant steel. Such materials have good mechanical and corrosion resistance properties.

The typical grades offered by SKF are:

### Inner ring

Corrosion-resistant steel

- 440C per AMS 5630
- PH13.8 per AMS 5629 H1000

### Outer ring

- Corrosion-resistant steel 17-4PH per AMS 5643 H1150

**Table 15** gives the different designations, reference standards and key characteristics for these materials.

For specific materials, refer to *Customized products* **page 150**.

## Liner

SKF standard high-performance liner type X1-40 consists of woven PTFE yarns reinforced with structural fibres (**figure 24**).

This liner has been qualified to AS 81820, AS 81934 and EN 2755 and meets all of their technical requirements.

Refer to *Customized products* **page 150** for other specific liner options

### Surface coating

To enable improvement of endurance performance, SKF offers a range of surface coating technologies that can be applied to the inner ring spherical surface. Refer to the related product tables.

XL  
XLHP  
XLNT

These coatings are tailored to extend life where the operating conditions are particularly demanding. Depending on operating conditions, bearing life can be improved by a factor in the order of 5 to 8 times.

These coatings enable bearing performance that meet and exceed the most demanding application requirements, such as those specified in AS 81819, AS 82819, AS 81820 Type A and ABS0576.

Contact SKF for further information and to select the most appropriate surface coating under specific application requirements.

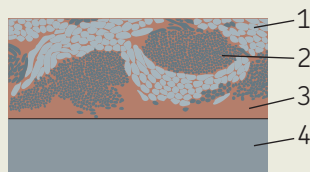
**Table 15**

### Standard bearing materials

| Material type             | Hardness HRC | Corrosion resistance | Material designation | EN                 | AMS      | Equivalent designation |
|---------------------------|--------------|----------------------|----------------------|--------------------|----------|------------------------|
| Corrosion-resistant steel | 55 to 62     | Good                 | 440C                 | EN 2030            | AMS 5630 | X100CrMo17 (Z100CD17)  |
|                           | 28 to 37     | Very good            | 17-4PH H1150         | EN 2539 or EN 3161 | AMS 5643 | Z6CNU17.04 H1150       |
|                           | ≥ 43         | Very good            | PH13.8 H1000         | –                  | AMS 5629 | –                      |

**Figure 24**

### Liner material



- 1 PTFE fibres
- 2 Structural fibres
- 3 Resin
- 4 Steel component



## Surface treatments

Spherical plain bearings can be exposed to various environmental conditions including humidity, heat and contamination. These can increase the risk of corrosion and wear.

Therefore, SKF supplies spherical plain bearings with standard surface treatments including:

- Zinc-nickel or cadmium plating, on the outer ring external surfaces, typically to enhance corrosion resistance and/or fretting resistance
- Chromium plating<sup>1)</sup> or SKF's chromium replacement coating (XCR), in the spherical contact, typically used to enhance corrosion resistance and/or dynamic performance. SKF's XCR surface treatment is free from chromium 6 compounds and has equivalent performance in comparison to chromium plating

Corrosion-resistant steel inner rings can be passivated, as required by the relevant standards.

Surface treatments for SKF self-lubricating spherical plain bearings are applied according to the following standards:

- Passivation according to AMS 2700 or ISO 8075
- Cadmium plating<sup>1)</sup> according to AMS-QQ-P-416 or AMS03-19<sup>2)</sup>
- Zinc-nickel plating according to AMS 2417
- Hard chromium plating<sup>1)</sup> according to AMS 2460<sup>3)</sup>

The bearing interface dimensions and tolerances are not modified when surface treatments are used.

For specific surface treatments, please refer to *Customized products* **page 150**.

## Dimensions and tolerances

Relevant interface dimensions and tolerances are listed in the product tables.

Where:

$\Delta d_{mp}$  = Single plane mean bore diameter deviation

$\Delta D_{mp}$  = Single plane mean outside diameter deviation

**Figure 25**, top figure, shows a typical measurement method for a single plane mean diameter deviation.

And

$\Delta d_s$  = Deviation of a single bore diameter

$\Delta D_s$  = Deviation of a single outside diameter

**Figure 25**, bottom figure, shows a typical measurement method for the deviation of a single diameter.

For more information about the measurement principle of interface dimensions and tolerances, refer to ISO 1132.

## Sealing and shielding

Most spherical plain bearings can be supplied with seals or shields. Refer to the relevant product tables.

Seals and shields protect the spherical contact area against solid contaminants such as dust or sand. Seals should be considered in environments with high contamination. They can also protect against liquid contaminants such as hydraulic fluids or de-icing liquids.

The shields are fixed on the outer ring and are in close contact with the inner ring spherical surface. For sealed versions, seals are pressed between shields and the inner ring spherical surface (**figure 26**).

The geometrical, physical and mechanical characteristics of the sealed and shielded spherical plain bearings are identical to those of the unprotected bearings, except:

- The life under dynamic load in contaminated environments can be increased significantly
- The torque, especially for sealed bearings, can be increased
- The swivelling angle is reduced by 2 to 4° depending on the bearing type

**Figure 25**

### Dimensional tolerances measurement principle

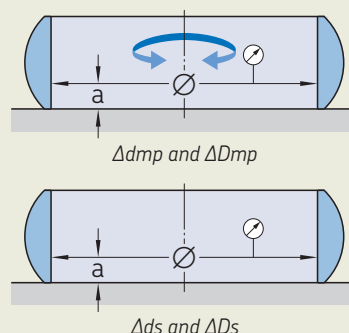
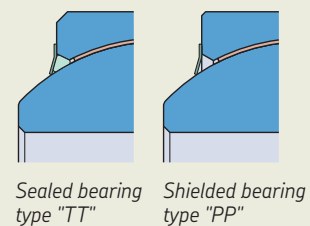


**Figure 26**

### Bearing sealing and shielding solutions



<sup>1)</sup> Treatment includes chromium 6 compounds and may be subject to environmental legislation

<sup>2)</sup> Formerly DEF STAN 03-19

<sup>3)</sup> Formerly AMS QQ-C-320

## Lined bore

Self-lubricating spherical plain bearings can be supplied with a self-lubricating liner in the bore (**figure 27**). This is suitable for applications requiring axial movements along the shaft or when a secondary rotational motion in the bore is needed.

The standard liner is the same as the one used on the spherical surface. For more information, refer to *Liner material* **page 148**.

The lined bore dimension,  $d_A$  and tolerance are listed in the relevant product tables.

Customized lined bore solutions can be supplied by SKF. Refer to *Customized products*.

## Customized products

SKF designs and manufactures customized self-lubricating spherical plain bearings to meet specific application requirements.

Examples can include, but are not limited to:

- **Specific dimensions, clearances and geometries**
- **Materials**
  - Alternative steel and corrosion-resistant steel alloys
  - Coated titanium alloys and aluminium alloys for lightweight solutions
- **Surface treatments**
  - Including:
    - Silver plating
    - PVD

Certain treatments include chromium 6 compounds and may be subject to environmental legislation

- **Liners:**
  - Fiberslip
  - Textilub

### Function

### Typical SKF customized solutions

#### Axial stops



*Screwed flange*



*Nut and washer*

#### Geometries and designs



*Special split longitudinal*



*Counterbore, pockets, notches*



*Ballpin*

#### Rotation and swivelling stops



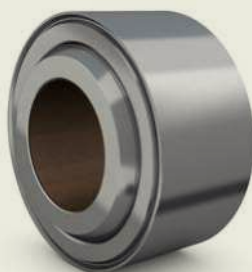
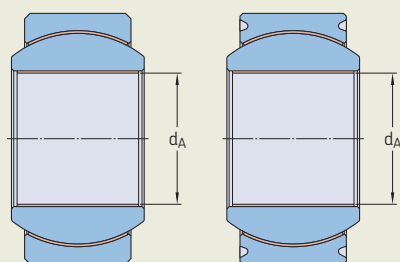
*Bump stops*



*Pin*

**Figure 27**

#### Lined bore bearing



## Legacy products

The following legacy series can still be supplied:

- 11AN..
- 11AW..
- ..SN
- ..SW

The legacy series listed in **table 16** are delivered and marked according to the listed cross-reference designation system (see also the relevant product tables):

## Legacy standards

SKF can supply bearings compliant to the following legacy standards:

- AS 21230 to AS 21233

## Customer standards

SKF can supply bearings compliant to the following customer standards:

- ASNA2121 to ASNA2124
- NSA 8134 to NSA 8137

Table 16

### Cross-reference to legacy products

| Variant                  | Cross-reference designation system | SKF Aerospace France designation system<br>Lons-le-Saunier (formerly known as SARMA) | SKF Aerospace U.K. Limited designation system<br>Clevedon (formerly known as AMPEP)                                                                                                                                                                                       |
|--------------------------|------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Light metric             | <b>LEN..</b>                       | XRA..                                                                                | 11C..N.. (not plated)<br>11F..N.. (chromium plated sphere)                                                                                                                                                                                                                |
| Narrow metric            | <b>NEN..</b>                       | XRE..                                                                                | 11C..W.. (not plated) or 11F..W.. (chromium plated sphere) for bore code 5 and 22<br>11C..N.. (not plated) or 11F..N.. (chromium plated sphere) for bore code 6 and 10<br>11C..E.. (not plated) or 11F..E.. (chromium plated sphere) for bore code 8 and ≥ 12 (except 22) |
| Wide metric              | <b>WEN..</b>                       | XRL..                                                                                | 11C..E.. (not plated) or 11F..E.. (chromium plated sphere) for bore code 5<br>11C..W.. (not plated) or 11F..W.. (chromium plated sphere) for bore code ≥ 6<br>11E..H (blended design inner ring)                                                                          |
| High misalignment metric | <b>HMEN..</b>                      | RL..SP.. (stepped design inner ring)                                                 |                                                                                                                                                                                                                                                                           |
| Narrow inch              | <b>NAS..</b>                       | XRE..                                                                                | 11HN.. (inner ring sphere surface coated)<br>11BN..                                                                                                                                                                                                                       |
| Narrow inch lined bore   | <b>NAS..A..</b>                    | XRE..A..                                                                             | 11LHN.. (inner ring sphere surface coated)<br>11LBN..                                                                                                                                                                                                                     |
| Wide inch                | <b>WAS..</b>                       | XRL..                                                                                | 11HW.. (inner ring sphere surface coated)<br>11BW..                                                                                                                                                                                                                       |
| Wide inch lined bore     | <b>WAS..A..</b>                    | XRL..A..                                                                             | 11LHW.. (inner ring sphere surface coated)<br>11LBW..                                                                                                                                                                                                                     |

# Bearing interfaces

## Fits and tolerances

Spherical plain bearings are mounted with different fits on the shaft and in the housing:

- Shaft: Loose fit, typically 0 to +0,020 mm (0 to +0.0008 in)
- Housing: Depending on application requirements, **table 17**

The fit selection can affect the selection of the clearance or torque variant (**table 17**).

For example, when mounting with interference fit:

- For metal-to-metal spherical plain bearings, to avoid the removal of all the bearing clearance and risk of blocking the bearing, sufficient initial internal clearance is needed. Using a reduced clearance variant is therefore not recommended
- For self-lubricating spherical plain bearings, to avoid high torque increase and risk of blocking the bearing, reduced torque or controlled clearance variants should be used

Refer to *Friction and torque* **page 146** and *Internal clearance* **page 147** for more information.

The required bearing fits and resulting operating clearance and torque are influenced by the coefficients of thermal expansion of the housing and shaft materials if different than the bearing material. This effect must be considered when selecting fits and bearing initial internal clearance and torque.

**Table 17**

### Housing fits for spherical plain bearings

| Application conditions                                                                               | Recommended fit                                                                | Recommended bearing variant   |                                        | Effect on internal clearance or torque                   |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------|----------------------------------------|----------------------------------------------------------|
|                                                                                                      |                                                                                | Metal-to-metal bearings       | Self-lubricating bearings              |                                                          |
| Risk for push-out, heavy load, matched assembly required                                             | Interference fit<br>−0,002 to −0,012 mm<br>−0.0001 to −0.0005 in               | Standard clearance            | Reduced torque or controlled clearance | Moderate internal clearance reduction or torque increase |
| Accurate torque or clearance needed, low push-out risk, easy axial positioning needed                | Loose fit with small clearance<br>+0,025 to +0,010 mm<br>+0.0010 to +0.0004 in | Standard or reduced clearance | Standard or reduced torque             | Not affecting internal clearance nor torque              |
| Accurate torque or clearance needed, low push-out risk, adhesive must be applied in the housing bore | Loose fit with large clearance<br>+0,100 to +0,050 mm<br>+0.0040 to +0.0020 in | Standard or reduced clearance | Standard or reduced torque             | Not affecting internal clearance nor torque              |
| Enable re-use of housing, matched assembly required for larger bearing outer diameters               | Transition fit<br>+0,020 to −0,005 mm<br>+0.0008 to −0.0002 in                 | Standard or reduced clearance | Standard or reduced torque             | Small internal clearance reduction or torque increase    |

# Mounting

Mount spherical plain bearings in a clean environment and with care to achieve maximum performance and service life. Leave the bearings in their original packages until immediately before mounting so they are not exposed to any contaminants. Also, make sure mating components are clean before mounting the bearings.

Bearings should be mounted onto their shaft seats with a loose fit, refer to *Fits and tolerances* **page 152**. High interference fit could damage the inner ring and subsequently affect bearing performance.

When mounting a bearing in a housing, use an assembly tool which pushes on the outer ring whilst supporting both the outer and inner ring (**figure 28**).

When mounting a bearing on a shaft, use an assembly tool pushing on the inner ring while supporting the outer ring.

This is to ensure that the mounting force never acts on the sliding contact surfaces which could damage the bearing (**figures 29 and 30**).

It is possible to use a mechanical press to mount a bearing (**figure 31**). To avoid damage to the bearing, under no circumstances should a method involving shock load or impact be used (**figure 32**).

Bearings mounted with an interference fit should be assembled using a temperature difference between the bearing and housing (e.g. cooling the bearing with liquid nitrogen or refrigeration unit, or heating the housing) to ease assembly. The temperature used must stay between the permissible bearing temperature limits (For more information, refer to *Operating temperature* **pages 138 and 147**).

Depending on bearing mounting conditions, a retaining or a jointing compound can be used at the interface between the housing and the bearing outer ring:

- A retaining compound between the outer ring and housing can be used to maintain the bearing position. This is typically required for bearings fitted with a clearance fit in the housing. The effectiveness of the compound used should be tested to confirm its suitability for the application requirements
- To counteract fretting or galvanic corrosion between the metallic surfaces of the housing and the bearing outer ring, a jointing compound can be applied

Do not allow the retaining or jointing compound to enter the bearing or to obstruct the lubrication groove and holes in the outer ring of metal-to-metal spherical plain bearings.

Figure 28

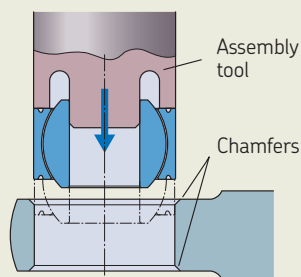


Figure 29

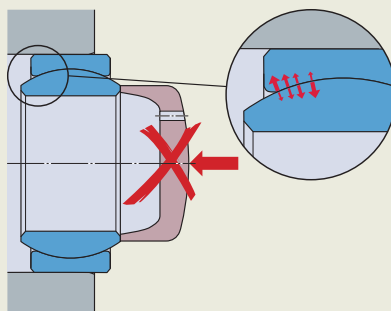


Figure 30

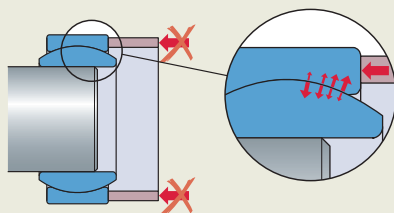


Figure 31

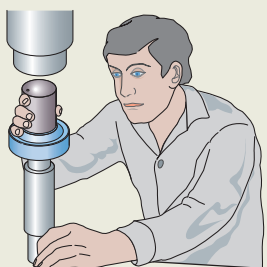
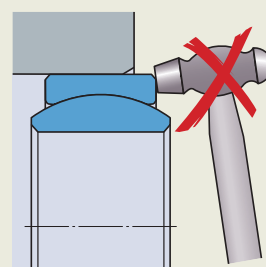


Figure 32



# Bearing retention

Spherical plain bearings must be retained in the housing. Common solutions are described below.

The retention process can impact the bearing torque and/or internal clearance.

## 2

### Anvil staking Process

- 1 Install bearing as detailed in *Mounting* **page 153**. Ensure the bearing is correctly axially centred in housing.
- 2 Determine the staking load required for bearing size and the housing material. Refer to *Staking and pushout load* **page 154**.
- 3 To confirm suitability of the staking loads, defined in step (2), slightly reduce the staking load and stake the first bearing from the batch using the following steps.
- 4 Position the bearing assembly on the location pin of the staking tool, as shown in **figure 33**. Apply the staking load and stake the first face.
- 5 Replace the lower anvil with a second staking head as shown in **figure 34**. Turn the bearing and housing over, locate the staked groove on the staking head and, applying the staking load, stake the second face.

- 6 Remove the bearing assembly, remove any surplus of retaining or jointing compound, and check rotational torque and axial retention.
- 7 If the staking acceptance criteria given in **page 154** are met, continue with the remaining components in the batch at the staking load established in step (3). If requirements are not met, adjust the staking load and repeat from step (4).

As an alternative to the above staking method, the staking of the two sides can be carried out in one step (omitting the staking anvil step in (4) above). This alternative should not be applied if a clearance fit is used.

### Staking acceptance

After staking, the staked lip should be inspected for any damage, cracking or incomplete staking areas.

Two main criteria can be used to validate the staking:

- Check the retaining strength of the staked lip. The installed bearing can be axially proof loaded (For more information, refer to *Staking and pushout load* below). Loads must be applied through the outer ring of the bearing and not through the inner ring
- Check the gap between the lip and housing chamfer. This should be checked with a feeler gauge and should not exceed 0.127 mm (0.005 in) over 40% of the staking lip circumference. See **figure 35**.

### Staking and pushout load

For additional information about staking of standard bearings, refer to the relevant standards, including TR 4541, MIL-HDBK-1599, NAS 0331, NFL 31-081 and NFL 31-083.

Figure 33

Tooling arrangement first stage stake

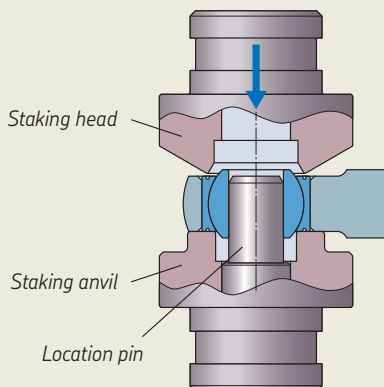


Figure 34

Tooling arrangement final stage stake

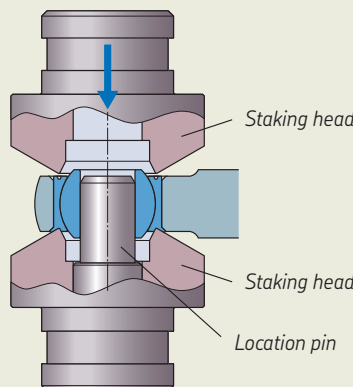
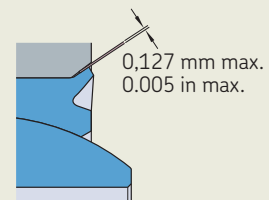


Figure 35

Staking gauge control





## Roller staking

Roller staking is another lip deforming method. This is carried out using a rotating head with rotating discs or rollers running in the staking groove, which deform the outer ring lip.

## Threaded or bolted retention plate

Spherical plain bearings with chamfered outer rings can be retained in the housing by using either a threaded or bolted plate (**figure 36**). This method improves axial load carrying capabilities and eases assembly and bearing replacement but increases weight and requires more space.

For mounting of customized designs, such as screwed flanges, refer to *Customized products* **page 141** and **150**.

## Dismounting

Spherical plain bearings can be removed by pushing the bearing out of its housing.

The removal of bearings retained by staking can be facilitated if one retaining lip is machined away before pressing the bearing out. Care must be taken not to damage the housing.

A typical dismounting method is shown in **figure 37**.

A dismounted bearing should not be reused.

SKF supplies bearings with oversized outer diameters in a range of increments to allow bearing replacement in housings.

The housing should be thoroughly cleaned of any hardened retaining or jointing compound. The housing bore can also be re-machined and should be verified dimensionally before the new bearing is installed, especially if fretting damage is evident.

## Storage

The conditions under which bearings, seals and lubricants are stored can have an adverse effect on their performance. Inventory control can also play an important role in performance, particularly for bearings having seals and lubricants. Therefore, SKF recommends a “first in, first out” inventory policy.

### Storage conditions

To maintain the integrity of the product during storage, SKF recommends the following basic housekeeping practices (**table 18**):

- Store bearings in a stable, clean, vibration-free, and dry area with a cool, and steady temperature
- Control and limit relative humidity in the storage area
- Keep bearings in their original unopened packages until immediately prior to mounting to prevent risk of bearing deterioration such as the ingress of contaminants

After 5 years of storage, the grease in metal-to-metal bearings ages and must be changed by SKF.

For storage outside these conditions, the stated storage life is not guaranteed. Contact SKF for more information.

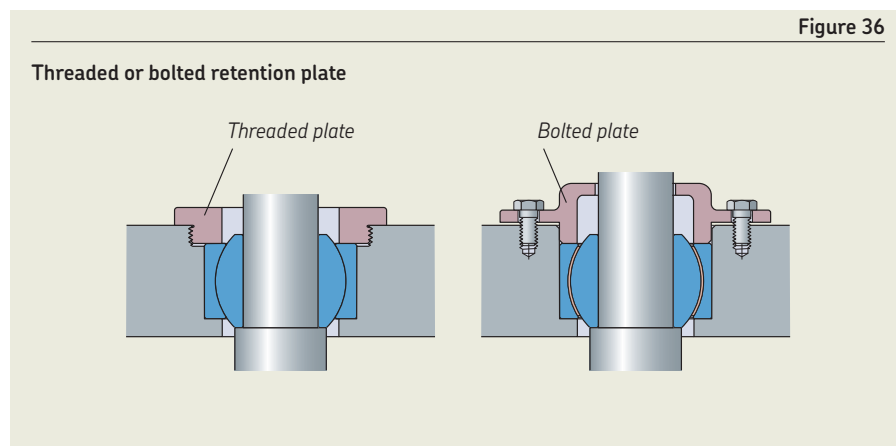
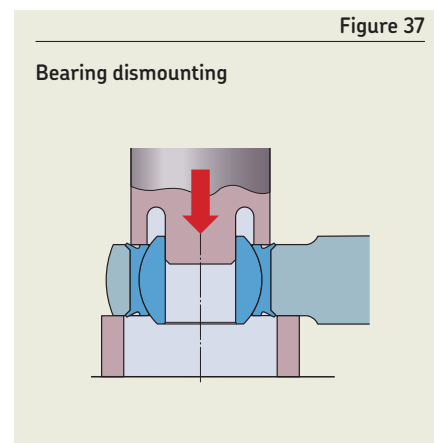


**Table 18**

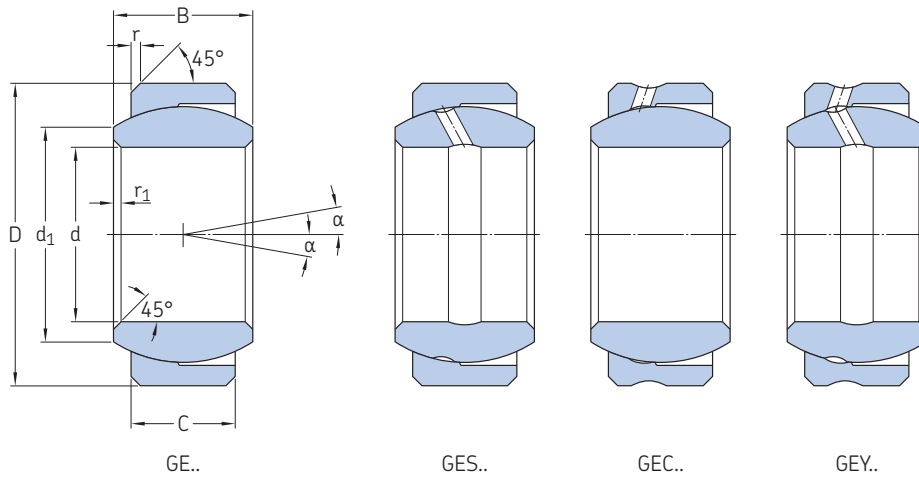
| Bearing storage conditions |                              |                              |
|----------------------------|------------------------------|------------------------------|
| Standard                   | Metal-to-metal bearings      | Self-lubricating bearings    |
| Storage life               | 5 years                      | 15 years <sup>1)</sup>       |
| Storage temperature        | 15 to 35 °C<br>(55 to 95 °F) | 15 to 25 °C<br>(55 to 77 °F) |
| Relative humidity          | 50 to 70%                    | 50 to 70%                    |

<sup>1)</sup> Can be limited by specific combinations of surface treatment and marking technology. Always refer to the dates indicated on SKF's packaging. Contact SKF for more information.



## 2.1 Metal-to-metal loader slot (metric dimensions)

GE.. bore code 4 to 20



|                                |                                                                                                                                                           |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2337                                                                                                                                                   |
| <b>Product standards</b>       | EN 2336<br>(Bearing steel)<br>EN 2588<br>(Corrosion-resistant steel)                                                                                      |
| <b>Surface treatment</b>       | For products with inner and outer rings in bearing steel or corrosion-resistant steel, one of the spherical surfaces is treated with molybdenum disulfide |

### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$ | $\Delta d_s$ | D  | $\Delta D_{mp}$ | $\Delta D_s$ | C<br>0/-0,25 | B<br>0/-0,06 |
|-------------------|--------------|-----------------|--------------|----|-----------------|--------------|--------------|--------------|
| –                 | mm           | $\mu m$         |              | mm | $\mu m$         |              | mm           |              |
| 4 <sup>1)</sup>   | 4            | 0/-8            | +2/-10       | 12 | 0/-8            | +5/-13       | 3            | 5            |
| 5                 | 5            | 0/-8            | +2/-10       | 14 | 0/-8            | +5/-13       | 4            | 6            |
| 6                 | 6            | 0/-8            | +2/-10       | 14 | 0/-8            | +5/-13       | 4            | 6            |
| 8                 | 8            | 0/-8            | +2/-10       | 16 | 0/-8            | +5/-13       | 5            | 8            |
| 10                | 10           | 0/-8            | +2/-10       | 19 | 0/-9            | +6/-15       | 6            | 9            |
| 12                | 12           | 0/-8            | +3/-11       | 22 | 0/-9            | +6/-15       | 7            | 10           |
| 15                | 15           | 0/-8            | +3/-11       | 26 | 0/-9            | +6/-15       | 9            | 12           |
| 17                | 17           | 0/-8            | +3/-11       | 30 | 0/-11           | +8/-19       | 10           | 14           |
| 20                | 20           | 0/-10           | +3/-13       | 35 | 0/-11           | +8/-19       | 12           | 16           |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d <sub>1</sub> | r       | r <sub>1</sub> | $\alpha^{3)}$ | Mass ≈ | Static limit loads <sup>2)</sup><br>Radial C <sub>s</sub> | Axial C <sub>a</sub> | Axial clearance<br>Standard | Reduced | Radial clearance max<br>Standard | Reduced |
|-------------------|---------------------------|---------|----------------|---------------|--------|-----------------------------------------------------------|----------------------|-----------------------------|---------|----------------------------------|---------|
| –                 | mm                        |         |                | °             | g      | kN                                                        |                      | $\mu m$                     |         |                                  |         |
| 4 <sup>1)</sup>   | 6,2                       | 0,4/0,7 | 0,3/0,6        | 16            | 3      | 7,7                                                       | 0,45                 | 30/60                       | 1/30    | 15                               | 8       |
| 5                 | 8                         | 0,4/0,7 | 0,3/0,6        | 13            | 4      | 14                                                        | 0,8                  | 30/60                       | 1/30    | 15                               | 8       |
| 6                 | 8                         | 0,4/0,7 | 0,3/0,6        | 13            | 4      | 17,5                                                      | 1                    | 30/60                       | 1/30    | 15                               | 8       |
| 8                 | 10,2                      | 0,5/0,8 | 0,5/0,8        | 15            | 8      | 27                                                        | 1,8                  | 30/60                       | 1/30    | 15                               | 8       |
| 10                | 13,2                      | 0,5/0,8 | 0,5/0,8        | 12            | 12     | 44                                                        | 2,5                  | 30/60                       | 1/30    | 15                               | 8       |
| 12                | 16                        | 0,6/1   | 0,5/0,8        | 11            | 17     | 57                                                        | 3,5                  | 30/60                       | 1/30    | 15                               | 8       |
| 15                | 18,5                      | 0,6/1   | 0,5/0,8        | 9             | 32     | 87                                                        | 5,3                  | 30/60                       | 1/30    | 15                               | 8       |
| 17                | 20,7                      | 0,9/1,3 | 0,7/1,1        | 10            | 54     | 112                                                       | 6,7                  | 30/60                       | 1/30    | 15                               | 8       |
| 20                | 24,1                      | 0,9/1,3 | 0,7/1,1        | 9             | 65     | 162                                                       | 9,8                  | 30/60                       | 1/30    | 15                               | 8       |

<sup>1)</sup> SKF option

<sup>2)</sup> Loads are given in the opposite direction to the slots and are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed bearings, refer to page 140

## Designation system

|                                               |                                                                         |                         |                |    |   |    |       |   |    |     |     |
|-----------------------------------------------|-------------------------------------------------------------------------|-------------------------|----------------|----|---|----|-------|---|----|-----|-----|
| Examples:                                     | ZWGES20D-C2A-2CP6R10<br>QGEC30EE                                        | Z                       | W              | GE | S | 20 | D-C2A | E | -2 | CP6 | R10 |
| <b>Surface treatment of outer ring</b>        |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Not plated                                                              |                         |                |    |   |    |       |   |    |     |     |
| Z <sup>1)</sup>                               | Cadmium plated external dimensions                                      |                         |                |    |   |    |       |   |    |     |     |
| SZ <sup>1)</sup>                              | Zinc-nickel plated external dimensions                                  |                         |                |    |   |    |       |   |    |     |     |
| <b>Material</b>                               |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Bearing steel inner ring and outer ring                                 |                         |                |    |   |    |       |   |    |     |     |
| W                                             | Corrosion-resistant steel inner ring and outer ring                     |                         |                |    |   |    |       |   |    |     |     |
| Q <sup>1)</sup>                               | Bronze beryllium inner ring and bearing steel outer ring                |                         |                |    |   |    |       |   |    |     |     |
| <b>Basic designation</b>                      |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| <b>Lubrication grooves</b>                    |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Without lubrication groove                                              |                         |                |    |   |    |       |   |    |     |     |
| S                                             | Lubrication by inner ring                                               |                         |                |    |   |    |       |   |    |     |     |
| C <sup>3)</sup>                               | Lubrication by outer ring                                               |                         |                |    |   |    |       |   |    |     |     |
| Y <sup>1)</sup>                               | Lubrication by inner and outer ring                                     |                         |                |    |   |    |       |   |    |     |     |
| <b>Bore code</b>                              |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| <b>Clearance code</b>                         |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| <b>Axial clearance</b>                        |                                                                         | <b>Radial clearance</b> |                |    |   |    |       |   |    |     |     |
| D-C2A                                         | Standard                                                                |                         | Standard       |    |   |    |       |   |    |     |     |
| No code <sup>1)</sup>                         | Reduced                                                                 |                         | No requirement |    |   |    |       |   |    |     |     |
| D <sup>1)</sup>                               | Standard                                                                |                         | No requirement |    |   |    |       |   |    |     |     |
| D-C1A <sup>1)</sup>                           | No requirement                                                          |                         | Reduced        |    |   |    |       |   |    |     |     |
| -C3A                                          | Reduced                                                                 |                         | Reduced        |    |   |    |       |   |    |     |     |
| <b>Seal</b>                                   |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | No seal                                                                 |                         |                |    |   |    |       |   |    |     |     |
| E <sup>4)</sup>                               | Sealed on the slot side                                                 |                         |                |    |   |    |       |   |    |     |     |
| EE <sup>4)</sup>                              | Sealed on both sides                                                    |                         |                |    |   |    |       |   |    |     |     |
| <b>Lubricant</b>                              |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Grease G354                                                             |                         |                |    |   |    |       |   |    |     |     |
| -2                                            | Grease G395                                                             |                         |                |    |   |    |       |   |    |     |     |
| <b>Surface treatment of inner ring sphere</b> |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Not plated                                                              |                         |                |    |   |    |       |   |    |     |     |
| CP6 <sup>5)</sup>                             | Chromium plated sphere                                                  |                         |                |    |   |    |       |   |    |     |     |
| CP109 <sup>5)</sup>                           | XCR plating on sphere (chromium 6 free replacement to chromium plating) |                         |                |    |   |    |       |   |    |     |     |
| CP55 <sup>2)</sup>                            | Passivated corrosion-resistant steel inner ring                         |                         |                |    |   |    |       |   |    |     |     |
| <b>Over-size</b>                              |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Standard outer diameter size                                            |                         |                |    |   |    |       |   |    |     |     |
| R10 <sup>1)</sup>                             | 0,1 mm oversized outer diameter                                         |                         |                |    |   |    |       |   |    |     |     |
| R20 <sup>1)</sup>                             | 0,2 mm oversized outer diameter                                         |                         |                |    |   |    |       |   |    |     |     |

1) SKF option

2) Available only for inner ring in corrosion-resistant steel

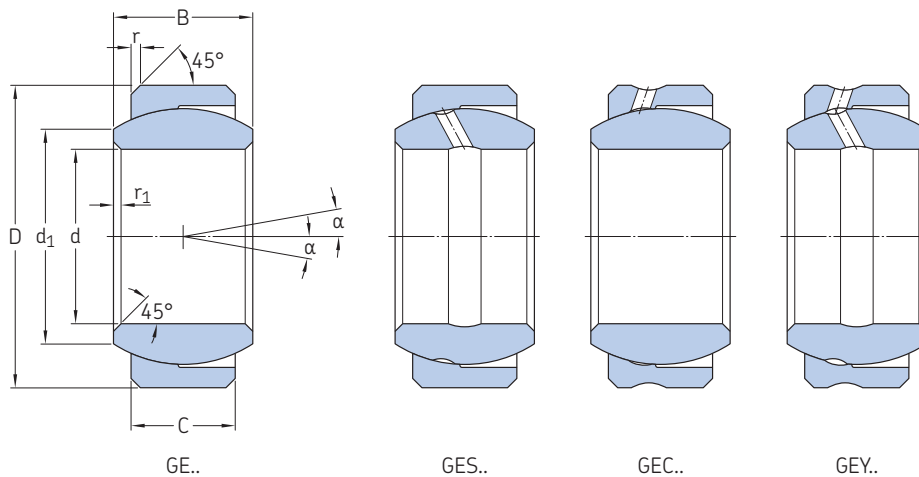
3) In the outer ring sphere, central lubrication groove only for  $d \leq 6$

4) Only available for  $d \geq 6$

5) SKF option, available only for inner ring in corrosion-resistant steel

## 2.1 Metal-to-metal loader slot (metric dimensions)

GE.. bore code 25 to 80



|                                |                                                                                                                                                           |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2337                                                                                                                                                   |
| <b>Product standards</b>       | EN 2336<br>(Bearing steel)<br>EN 2588<br>(Corrosion-resistant steel)                                                                                      |
| <b>Surface treatment</b>       | For products with inner and outer rings in bearing steel or corrosion-resistant steel, one of the spherical surfaces is treated with molybdenum disulfide |

### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$ | $\Delta d_s$ | D   | $\Delta D_{mp}$ | $\Delta D_s$ | C<br>0/-0,25 | B<br>0/-0,06 |
|-------------------|--------------|-----------------|--------------|-----|-----------------|--------------|--------------|--------------|
| –                 | mm           | $\mu m$         |              | mm  | $\mu m$         |              | mm           |              |
| 25                | 25           | 0/-10           | +3/-13       | 42  | 0/-11           | +8/-19       | 16           | 20           |
| 30                | 30           | 0/-10           | +3/-13       | 47  | 0/-11           | +8/-19       | 18           | 22           |
| 35                | 35           | 0/-12           | +3/-15       | 55  | 0/-13           | +10/-23      | 20           | 25           |
| 40                | 40           | 0/-12           | +3/-15       | 62  | 0/-13           | +10/-23      | 22           | 28           |
| 45                | 45           | 0/-12           | +3/-15       | 68  | 0/-13           | +10/-23      | 25           | 32           |
| 50                | 50           | 0/-12           | +3/-15       | 75  | 0/-13           | +10/-23      | 28           | 35           |
| 60                | 60           | 0/-15           | +4/-19       | 90  | 0/-15           | +13/-28      | 36           | 44           |
| 70                | 70           | 0/-15           | +4/-19       | 105 | 0/-15           | +13/-28      | 40           | 49           |
| 80                | 80           | 0/-15           | +4/-19       | 120 | 0/-15           | +13/-28      | 45           | 55           |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 | r       | r1      | $\alpha^2)$ | Mass $\approx$ | Static limit loads <sup>1)</sup><br>Radial $C_s$ | Axial $C_a$ | Axial clearance<br>Standard<br>Reduced | Radial clearance max<br>Standard<br>Reduced |
|-------------------|---------------|---------|---------|-------------|----------------|--------------------------------------------------|-------------|----------------------------------------|---------------------------------------------|
| –                 | mm            |         |         | °           | g              | kN                                               |             | $\mu m$                                |                                             |
| 25                | 29,3          | 0,9/1,3 | 0,7/1,1 | 7           | 115            | 270                                              | 18          | 30/60<br>1/30                          | 15<br>8                                     |
| 30                | 34,2          | 0,9/1,3 | 0,7/1,1 | 6           | 160            | 393                                              | 25          | 30/60<br>1/30                          | 15<br>8                                     |
| 35                | 39,8          | 0,9/1,3 | 0,7/1,1 | 7           | 229            | 508                                              | 31          | 40/80<br>1/40                          | 20<br>10                                    |
| 40                | 45            | 1,4/1,8 | 1,2/1,7 | 7           | 315            | 637                                              | 38          | 40/80<br>1/40                          | 20<br>10                                    |
| 45                | 50,8          | 1,4/1,8 | 1,2/1,7 | 7           | 460            | 825                                              | 50          | 40/80<br>1/40                          | 20<br>10                                    |
| 50                | 55,9          | 1,4/1,8 | 1,2/1,7 | 7           | 560            | 1 017                                            | 64          | 40/80<br>1/40                          | 20<br>10                                    |
| 60                | 66,8          | 1,4/1,8 | 1,2/1,7 | 6           | 1 100          | 1 584                                            | 104         | 50/100<br>1/50                         | 25<br>15                                    |
| 70                | 77,8          | 1,4/1,8 | 1,2/1,7 | 6           | 1 540          | 2 013                                            | 128         | 50/100<br>1/50                         | 25<br>15                                    |
| 80                | 89,4          | 1,4/1,8 | 1,2/1,7 | 6           | 2 290          | 2 640                                            | 163         | 50/100<br>1/50                         | 25<br>15                                    |

<sup>1)</sup> Loads are given in the opposite direction to the slots and are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>2)</sup> Values are given for non protected bearings. For sealed bearings, refer to page 140



## Designation system

|                                               |                                                                         |                         |                |    |   |    |       |   |    |     |     |
|-----------------------------------------------|-------------------------------------------------------------------------|-------------------------|----------------|----|---|----|-------|---|----|-----|-----|
| Examples:                                     | ZWGES20D-C2A-2CP6R10<br>QGEC30EE                                        | Z                       | W              | GE | S | 20 | D-C2A | E | -2 | CP6 | R10 |
| <b>Surface treatment of outer ring</b>        |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Not plated                                                              |                         |                |    |   |    |       |   |    |     |     |
| Z <sup>1)</sup>                               | Cadmium plated external dimensions                                      |                         |                |    |   |    |       |   |    |     |     |
| SZ <sup>1)</sup>                              | Zinc-nickel plated external dimensions                                  |                         |                |    |   |    |       |   |    |     |     |
| <b>Material</b>                               |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Bearing steel inner ring and outer ring                                 |                         |                |    |   |    |       |   |    |     |     |
| W                                             | Corrosion-resistant steel inner ring and outer ring                     |                         |                |    |   |    |       |   |    |     |     |
| Q <sup>1)</sup>                               | Bronze beryllium inner ring and bearing steel outer ring                |                         |                |    |   |    |       |   |    |     |     |
| <b>Basic designation</b>                      |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| <b>Lubrication grooves</b>                    |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Without lubrication groove                                              |                         |                |    |   |    |       |   |    |     |     |
| S                                             | Lubrication by inner ring                                               |                         |                |    |   |    |       |   |    |     |     |
| C <sup>3)</sup>                               | Lubrication by outer ring                                               |                         |                |    |   |    |       |   |    |     |     |
| Y <sup>1)</sup>                               | Lubrication by inner and outer ring                                     |                         |                |    |   |    |       |   |    |     |     |
| <b>Bore code</b>                              |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| <b>Clearance code</b>                         |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| <b>Axial clearance</b>                        |                                                                         | <b>Radial clearance</b> |                |    |   |    |       |   |    |     |     |
| D-C2A                                         | Standard                                                                |                         | Standard       |    |   |    |       |   |    |     |     |
| No code <sup>1)</sup>                         | Reduced                                                                 |                         | No requirement |    |   |    |       |   |    |     |     |
| D <sup>1)</sup>                               | Standard                                                                |                         | No requirement |    |   |    |       |   |    |     |     |
| D-C1A <sup>1)</sup>                           | No requirement                                                          |                         | Reduced        |    |   |    |       |   |    |     |     |
| -C3A                                          | Reduced                                                                 |                         | Reduced        |    |   |    |       |   |    |     |     |
| <b>Seal</b>                                   |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | No seal                                                                 |                         |                |    |   |    |       |   |    |     |     |
| E <sup>4)</sup>                               | Sealed on the slot side                                                 |                         |                |    |   |    |       |   |    |     |     |
| EE <sup>4)</sup>                              | Sealed on both sides                                                    |                         |                |    |   |    |       |   |    |     |     |
| <b>Lubricant</b>                              |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Grease G354                                                             |                         |                |    |   |    |       |   |    |     |     |
| -2                                            | Grease G395                                                             |                         |                |    |   |    |       |   |    |     |     |
| <b>Surface treatment of inner ring sphere</b> |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Not plated                                                              |                         |                |    |   |    |       |   |    |     |     |
| CP6 <sup>5)</sup>                             | Chromium plated sphere                                                  |                         |                |    |   |    |       |   |    |     |     |
| CP109 <sup>5)</sup>                           | XCR plating on sphere (chromium 6 free replacement to chromium plating) |                         |                |    |   |    |       |   |    |     |     |
| CP55 <sup>2)</sup>                            | Passivated corrosion-resistant steel inner ring                         |                         |                |    |   |    |       |   |    |     |     |
| <b>Over-size</b>                              |                                                                         |                         |                |    |   |    |       |   |    |     |     |
| No code                                       | Standard outer diameter size                                            |                         |                |    |   |    |       |   |    |     |     |
| R10 <sup>1)</sup>                             | 0,1 mm oversized outer diameter                                         |                         |                |    |   |    |       |   |    |     |     |
| R20 <sup>1)</sup>                             | 0,2 mm oversized outer diameter                                         |                         |                |    |   |    |       |   |    |     |     |

<sup>1)</sup> SKF option

<sup>2)</sup> Available only for inner ring in corrosion-resistant steel

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 6$

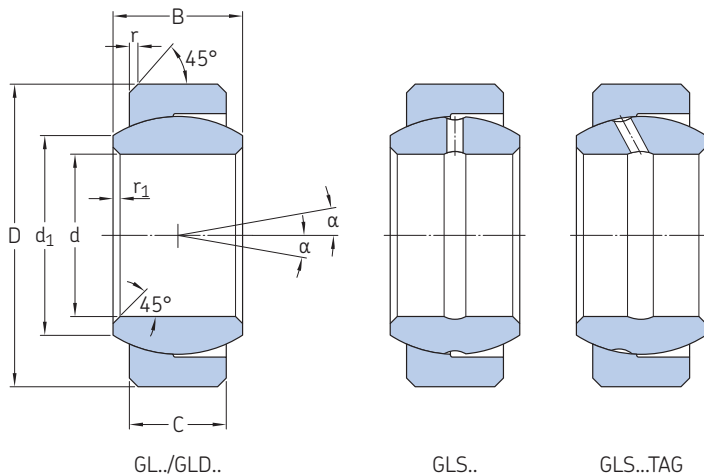
<sup>4)</sup> Only available for  $d \geq 6$

<sup>5)</sup> SKF option, available only for inner ring in corrosion-resistant steel

## 2.2 Metal-to-metal loader slot normal (metric dimensions)

GL..., GLD..., GLS... and GLS..TAG bore code **4** to **17/30**

Technical specification –  
Product standards –



### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$<br>GL..., GLD... and GLS.. | GLS..TAG only | D  | $\Delta D_{mp}$<br>GL..., GLD... and GLS.. | GLS..TAG only | C h11 | B h11 |
|-------------------|--------------|--------------------------------------------|---------------|----|--------------------------------------------|---------------|-------|-------|
| –                 | mm           | $\mu m$                                    |               | mm | $\mu m$                                    |               | mm    |       |
| <b>4</b>          | 4            | 0/-8                                       | –             | 12 | 0/-8                                       | –             | 3     | 5     |
| <b>5</b>          | 5            | 0/-8                                       | –             | 14 | 0/-8                                       | –             | 4     | 6     |
| <b>6</b>          | 6            | 0/-8                                       | –             | 14 | 0/-8                                       | –             | 4     | 6     |
| <b>8/16</b>       | 8            | 0/-8                                       | –             | 16 | 0/-8                                       | –             | 5     | 8     |
| <b>8</b>          | 8            | 0/-8                                       | –             | 17 | 0/-8                                       | –             | 5     | 8     |
| <b>10/19</b>      | 10           | 0/-8                                       | –             | 19 | 0/-9                                       | –             | 6     | 9     |
| <b>10</b>         | 10           | 0/-8                                       | –             | 20 | 0/-9                                       | –             | 6     | 9     |
| <b>12</b>         | 12           | 0/-8                                       | +11/0         | 22 | 0/-9                                       | 0/-9          | 7     | 10    |
| <b>14</b>         | 14           | 0/-8                                       | +11/0         | 25 | 0/-9                                       | 0/-9          | 8     | 11    |
| <b>15/26</b>      | 15           | 0/-8                                       | +11/0         | 26 | 0/-9                                       | 0/-9          | 9     | 12    |
| <b>15</b>         | 15           | 0/-8                                       | +11/0         | 28 | 0/-9                                       | 0/-9          | 9     | 12    |
| <b>16</b>         | 16           | 0/-8                                       | +11/0         | 28 | 0/-9                                       | 0/-9          | 9     | 12    |
| <b>17</b>         | 17           | 0/-8                                       | +11/0         | 32 | 0/-11                                      | 0/-11         | 10    | 14    |
| <b>17/30</b>      | 17           | 0/-8                                       | +11/0         | 30 | 0/-11                                      | 0/-11         | 10    | 14    |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 | r                       | r1            | r             | r1            | $\alpha^{2)}$ | Mass | Static limit loads <sup>1)</sup> | Axial clearance |       |                  |          |
|-------------------|---------------|-------------------------|---------------|---------------|---------------|---------------|------|----------------------------------|-----------------|-------|------------------|----------|
| –                 | mm            | GL..., GLD... and GLS.. | GLS..TAG only | GLS..TAG only | GLS..TAG only | °             | g    | Radial Cs                        | Axial Ca        | GL... | GLD... and GLS.. | GLS..TAG |
| –                 | mm            |                         |               |               |               | °             | g    | kN                               | $\mu m$         |       |                  |          |
| <b>4</b>          | 6,2           | 0,4/0,8                 | 0,4/0,7       | –             | –             | 16            | 3    | 7,7                              | 0,45            | 0/30  | 30/60            | –        |
| <b>5</b>          | 8             | 0,4/0,8                 | 0,4/0,7       | –             | –             | 13            | 4    | 14                               | 0,8             | 0/30  | 30/60            | –        |
| <b>6</b>          | 8             | 0,4/0,8                 | 0,4/0,7       | –             | –             | 13            | 4    | 17,5                             | 1               | 0/30  | 30/60            | –        |
| <b>8/16</b>       | 10,2          | 0,4/0,8                 | 0,4/0,7       | –             | –             | 15            | 8    | 27                               | 1,8             | 0/30  | 30/60            | –        |
| <b>8</b>          | 10,2          | 0,4/0,8                 | 0,4/0,7       | –             | –             | 15            | 10   | 27                               | 1,8             | 0/30  | 30/60            | –        |
| <b>10/19</b>      | 13,2          | 0,4/0,8                 | 0,5/0,8       | –             | –             | 12            | 12   | 44                               | 2,5             | 0/30  | 30/60            | –        |
| <b>10</b>         | 13,2          | 0,4/0,8                 | 0,5/0,8       | –             | –             | 12            | 13   | 44                               | 2,5             | 0/30  | 30/60            | –        |
| <b>12</b>         | 14,9          | 0,7/1,2                 | 0,5/0,8       | 0,7           | 0,5           | 11            | 17   | 57                               | 3,5             | 0/30  | 30/60            | 5/15     |
| <b>14</b>         | 16,7          | 0,7/1,2                 | 0,5/0,8       | 0,7           | 0,5           | 10            | 22   | 60                               | 4               | 0/30  | 30/60            | 5/15     |
| <b>15/26</b>      | 18,5          | 0,7/1,2                 | 0,5/0,8       | 0,7           | 0,5           | 9             | 32   | 87                               | 5,3             | 0/30  | 30/60            | 5/15     |
| <b>15</b>         | 18,5          | 0,7/1,2                 | 0,5/0,8       | 0,7           | 0,5           | 9             | 34   | 87                               | 5,3             | 0/30  | 30/60            | 5/15     |
| <b>16</b>         | 18,5          | 0,7/1,2                 | 0,5/0,8       | 0,7           | 0,5           | 9             | 33   | 87                               | 5,3             | 0/30  | 30/60            | 5/15     |
| <b>17</b>         | 20,7          | 0,9/1,3                 | 0,7/1,1       | 1             | 0,5           | 10            | 52   | 112                              | 6,7             | 0/30  | 30/60            | 5/15     |
| <b>17/30</b>      | 20,7          | 0,9/1,3                 | 0,7/1,1       | 1             | 0,5           | 10            | 54   | 112                              | 6,7             | 0/30  | 30/60            | 5/15     |

<sup>1)</sup> Loads are given in the opposite direction to the slots and are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>2)</sup> Values are given for non protected bearings. For sealed bearings, refer to page 140



## Designation system

|                                                |                                                                          |   |   |    |   |    |     |   |    |     |     |
|------------------------------------------------|--------------------------------------------------------------------------|---|---|----|---|----|-----|---|----|-----|-----|
| Examples:                                      | ZWGLS20TAGE-2CP6R10                                                      | Z | W | GL | S | 20 | TAG | E | -2 | CP6 | R10 |
|                                                | QGLD15/26EE                                                              |   |   |    |   |    |     |   |    |     |     |
| <b>Surface treatment of outer ring</b>         |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Not plated                                                               |   |   |    |   |    |     |   |    |     |     |
| Z                                              | Cadmium plated external dimensions                                       |   |   |    |   |    |     |   |    |     |     |
| SZ                                             | Zinc-nickel plated external dimensions                                   |   |   |    |   |    |     |   |    |     |     |
| <b>Material</b>                                |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Bearing steel inner ring and outer ring                                  |   |   |    |   |    |     |   |    |     |     |
| W                                              | Corrosion-resistant steel inner ring and outer ring                      |   |   |    |   |    |     |   |    |     |     |
| Q                                              | Bronze beryllium inner ring and bearing steel outer ring                 |   |   |    |   |    |     |   |    |     |     |
| <b>Basic designation</b>                       |                                                                          |   |   |    |   |    |     |   |    |     |     |
| <b>Lubrication grooves and axial clearance</b> |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Without lubrication groove and reduced axial clearance                   |   |   |    |   |    |     |   |    |     |     |
| D                                              | Without lubrication groove and standard axial clearance                  |   |   |    |   |    |     |   |    |     |     |
| S                                              | Lubrication by inner ring (vertical groove) and standard axial clearance |   |   |    |   |    |     |   |    |     |     |
| S..TAG <sup>1)</sup>                           | Lubrication by inner ring (inclined groove) and reduced axial clearance  |   |   |    |   |    |     |   |    |     |     |
| <b>Bore code</b>                               |                                                                          |   |   |    |   |    |     |   |    |     |     |
| <b>Seal</b>                                    |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | No seal                                                                  |   |   |    |   |    |     |   |    |     |     |
| E <sup>3)</sup>                                | Sealed on the slot side                                                  |   |   |    |   |    |     |   |    |     |     |
| EE <sup>3)</sup>                               | Sealed on both sides                                                     |   |   |    |   |    |     |   |    |     |     |
| <b>Lubricant</b>                               |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Grease G354                                                              |   |   |    |   |    |     |   |    |     |     |
| -2                                             | Grease G395                                                              |   |   |    |   |    |     |   |    |     |     |
| <b>Surface treatment of inner ring</b>         |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Not plated                                                               |   |   |    |   |    |     |   |    |     |     |
| CP6 <sup>2)</sup>                              | Chromium plated sphere                                                   |   |   |    |   |    |     |   |    |     |     |
| CP109 <sup>2)</sup>                            | XCR plating on sphere (chromium 6 free replacement to chromium plating)  |   |   |    |   |    |     |   |    |     |     |
| CP55 <sup>2)</sup>                             | Passivated corrosion-resistant steel inner ring                          |   |   |    |   |    |     |   |    |     |     |
| <b>Oversize</b>                                |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Standard outer diameter size                                             |   |   |    |   |    |     |   |    |     |     |
| R10                                            | 0,1 mm oversized outer diameter                                          |   |   |    |   |    |     |   |    |     |     |
| R20                                            | 0,2 mm oversized outer diameter                                          |   |   |    |   |    |     |   |    |     |     |

<sup>1)</sup> Only available for bore code  $\geq 12$  and  $\leq 50$

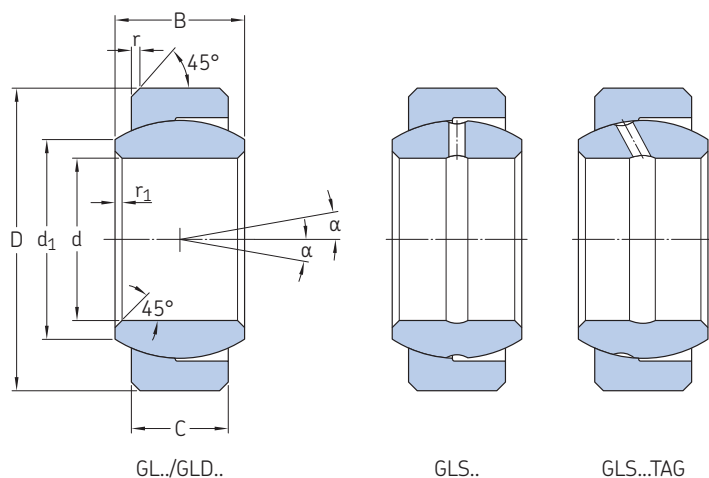
<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> Only available for  $d \geq 6$

## 2.2 Metal-to-metal loader slot normal (metric dimensions)

GL..., GLD..., GLS... and GLS..TAG bore code **20 to 80**

Technical specification –  
Product standards –



### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$<br>GL..., GLD... and GLS... | GLS...TAG only | D   | $\Delta D_{mp}$<br>GL..., GLD... and GLS... | GLS...TAG only | C h11 | B h11 |
|-------------------|--------------|---------------------------------------------|----------------|-----|---------------------------------------------|----------------|-------|-------|
| –                 | mm           | $\mu m$                                     |                | mm  | $\mu m$                                     |                | mm    |       |
| <b>20</b>         | 20           | 0/–10                                       | +13/0          | 35  | 0/–11                                       | 0/–11          | 12    | 16    |
| <b>25</b>         | 25           | 0/–10                                       | +13/0          | 42  | 0/–11                                       | 0/–11          | 16    | 20    |
| <b>30/47</b>      | 30           | 0/–10                                       | +13/0          | 47  | 0/–11                                       | 0/–11          | 18    | 22    |
| <b>35</b>         | 35           | 0/–12                                       | +16/0          | 55  | 0/–13                                       | 0/–13          | 20    | 25    |
| <b>40</b>         | 40           | 0/–12                                       | +16/0          | 62  | 0/–13                                       | 0/–13          | 22    | 28    |
| <b>45/68</b>      | 45           | 0/–12                                       | +16/0          | 68  | 0/–13                                       | 0/–13          | 25    | 32    |
| <b>50</b>         | 50           | 0/–12                                       | +16/0          | 75  | 0/–13                                       | 0/–13          | 28    | 35    |
| <b>55</b>         | 55           | 0/–15                                       | –              | 85  | 0/–15                                       | –              | 32    | 40    |
| <b>60</b>         | 60           | 0/–15                                       | –              | 90  | 0/–15                                       | –              | 36    | 44    |
| <b>70</b>         | 70           | 0/–15                                       | –              | 105 | 0/–15                                       | –              | 40    | 49    |
| <b>80</b>         | 80           | 0/–15                                       | –              | 120 | 0/–15                                       | –              | 45    | 55    |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 | r       | r1                       | r                     | r1     | $\alpha^{2)}$ | Mass  | Static limit loads <sup>1)</sup> | Axial clearance  | GL... | GLD... and GLS... | GLS...TAG |
|-------------------|---------------|---------|--------------------------|-----------------------|--------|---------------|-------|----------------------------------|------------------|-------|-------------------|-----------|
| –                 | mm            |         | GL..., GLD... and GLS... | GLS...TAG only +0,3/0 | +0,3/0 | °             | g     | Radial Cs kN                     | Axial Ca $\mu m$ |       |                   |           |
| <b>20</b>         | 24,1          | 0,9/1,3 | 0,7/1,1                  | 1                     | 0,5    | 9             | 65    | 162                              | 9,8              | 0/30  | 30/60             | 10/20     |
| <b>25</b>         | 29,3          | 0,9/1,3 | 0,7/1,1                  | 1                     | 0,5    | 7             | 115   | 270                              | 18               | 0/30  | 30/60             | 10/20     |
| <b>30/47</b>      | 34,2          | 0,9/1,3 | 0,7/1,1                  | 1                     | 0,5    | 6             | 160   | 393                              | 25               | 0/30  | 30/60             | 10/20     |
| <b>35</b>         | 39,8          | 0,9/1,3 | 0,7/1,1                  | 1                     | 0,5    | 7             | 229   | 508                              | 31               | 0/40  | 40/80             | 10/20     |
| <b>40</b>         | 45            | 1,2/1,7 | 1,2/1,7                  | 1,5                   | 0,5    | 7             | 315   | 637                              | 38               | 0/40  | 40/80             | 10/20     |
| <b>45/68</b>      | 50,8          | 1,2/1,7 | 1,2/1,7                  | 1,5                   | 0,5    | 7             | 460   | 825                              | 50               | 0/40  | 40/80             | 10/20     |
| <b>50</b>         | 55,9          | 1,2/1,7 | 1,2/1,7                  | 1,5                   | 0,5    | 7             | 560   | 1 017                            | 64               | 0/40  | 40/80             | 10/20     |
| <b>55</b>         | 62,2          | 1,2/1,7 | 1,2/1,7                  | –                     | –      | 7             | 805   | 1 297                            | 82               | 0/50  | 50/100            | –         |
| <b>60</b>         | 66,8          | 1,2/1,7 | 1,2/1,7                  | –                     | –      | 6             | 1 100 | 1 584                            | 104              | 0/50  | 50/100            | –         |
| <b>70</b>         | 77,8          | 1,2/1,7 | 1,2/1,7                  | –                     | –      | 6             | 1 540 | 2 013                            | 128              | 0/50  | 50/100            | –         |
| <b>80</b>         | 89,4          | 1,2/1,7 | 1,2/1,7                  | –                     | –      | 6             | 2 200 | 2 640                            | 163              | 0/50  | 50/100            | –         |

<sup>1)</sup> Loads are given in the opposite direction to the slots and are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>2)</sup> Values are given for non protected bearings. For sealed bearings, refer to page 140





## Designation system

|                                                |                                                                          |   |   |    |   |    |     |   |    |     |     |
|------------------------------------------------|--------------------------------------------------------------------------|---|---|----|---|----|-----|---|----|-----|-----|
| Examples:                                      | ZWGLS20TAGE-2CP6R10                                                      | Z | W | GL | S | 20 | TAG | E | -2 | CP6 | R10 |
|                                                | QGLD15/26EE                                                              |   |   |    |   |    |     |   |    |     |     |
| <b>Surface treatment of outer ring</b>         |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Not plated                                                               |   |   |    |   |    |     |   |    |     |     |
| Z                                              | Cadmium plated external dimensions                                       |   |   |    |   |    |     |   |    |     |     |
| SZ                                             | Zinc-nickel plated external dimensions                                   |   |   |    |   |    |     |   |    |     |     |
| <b>Material</b>                                |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Bearing steel inner ring and outer ring                                  |   |   |    |   |    |     |   |    |     |     |
| W                                              | Corrosion-resistant steel inner ring and outer ring                      |   |   |    |   |    |     |   |    |     |     |
| Q                                              | Bronze beryllium inner ring and bearing steel outer ring                 |   |   |    |   |    |     |   |    |     |     |
| <b>Basic designation</b>                       |                                                                          |   |   |    |   |    |     |   |    |     |     |
| <b>Lubrication grooves and axial clearance</b> |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Without lubrication groove and reduced axial clearance                   |   |   |    |   |    |     |   |    |     |     |
| D                                              | Without lubrication groove and standard axial clearance                  |   |   |    |   |    |     |   |    |     |     |
| S                                              | Lubrication by inner ring (vertical groove) and standard axial clearance |   |   |    |   |    |     |   |    |     |     |
| S..TAG <sup>1)</sup>                           | Lubrication by inner ring (inclined groove) and reduced axial clearance  |   |   |    |   |    |     |   |    |     |     |
| <b>Bore code</b>                               |                                                                          |   |   |    |   |    |     |   |    |     |     |
| <b>Seal</b>                                    |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | No seal                                                                  |   |   |    |   |    |     |   |    |     |     |
| E <sup>3)</sup>                                | Sealed on the slot side                                                  |   |   |    |   |    |     |   |    |     |     |
| EE <sup>3)</sup>                               | Sealed on both sides                                                     |   |   |    |   |    |     |   |    |     |     |
| <b>Lubricant</b>                               |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Grease G354                                                              |   |   |    |   |    |     |   |    |     |     |
| -2                                             | Grease G395                                                              |   |   |    |   |    |     |   |    |     |     |
| <b>Surface treatment of inner ring</b>         |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Not plated                                                               |   |   |    |   |    |     |   |    |     |     |
| CP6 <sup>2)</sup>                              | Chromium plated sphere                                                   |   |   |    |   |    |     |   |    |     |     |
| CP109 <sup>2)</sup>                            | XCR plating on sphere (chromium 6 free replacement to chromium plating)  |   |   |    |   |    |     |   |    |     |     |
| CP55 <sup>2)</sup>                             | Passivated corrosion-resistant steel inner ring                          |   |   |    |   |    |     |   |    |     |     |
| <b>Oversize</b>                                |                                                                          |   |   |    |   |    |     |   |    |     |     |
| No code                                        | Standard outer diameter size                                             |   |   |    |   |    |     |   |    |     |     |
| R10                                            | 0,1 mm oversized outer diameter                                          |   |   |    |   |    |     |   |    |     |     |
| R20                                            | 0,2 mm oversized outer diameter                                          |   |   |    |   |    |     |   |    |     |     |

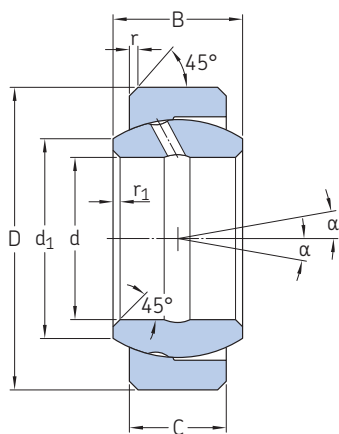
<sup>1)</sup> Only available for bore code  $\geq 12$  and  $\leq 50$

<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> Only available for  $d \geq 6$

## 2.3 Metal-to-metal loader slot normal reinforced (metric dimensions)

GLS..RTG



GLS..RTG

Technical specification –

Product standards –

### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$ H6 | D  | $\Delta D_{mp}$ h5 | C h11 | B 0/-0,05 |
|-------------------|--------------|--------------------|----|--------------------|-------|-----------|
| –                 | mm           | $\mu m$            | mm | $\mu m$            | mm    |           |
| 12                | 12           | +11/0              | 25 | 0/-9               | 9     | 12        |
| 14                | 14           | +11/0              | 28 | 0/-9               | 9     | 13        |
| 15                | 15           | +11/0              | 32 | 0/-11              | 10    | 14        |
| 16                | 16           | +11/0              | 32 | 0/-11              | 10    | 14        |
| 17                | 17           | +11/0              | 35 | 0/-11              | 13    | 17        |
| 20                | 20           | +13/0              | 42 | 0/-11              | 16    | 20        |
| 25                | 25           | +13/0              | 47 | 0/-11              | 18    | 22        |
| 30                | 30           | +13/0              | 55 | 0/-13              | 20    | 25        |
| 35                | 35           | +16/0              | 62 | 0/-13              | 22    | 28        |
| 40                | 40           | +16/0              | 68 | 0/-13              | 25    | 32        |
| 45                | 45           | +16/0              | 75 | 0/-13              | 28    | 35        |
| 50                | 50           | +16/0              | 85 | 0/-15              | 32    | 40        |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 ≈ | r +0,3/0 | r1 +0,3/0 | $\alpha^{2)}$ | Mass ≈ | Static limit loads <sup>1)</sup> Radial Cs | Axial Ca | Axial clearance |
|-------------------|-----------------|----------|-----------|---------------|--------|--------------------------------------------|----------|-----------------|
| –                 | mm              |          |           | °             | g      | kN                                         |          | $\mu m$         |
| 12                | 17,2            | 0,7      | 0,5       | 10            | 30     | 65                                         | 4,1      | 30/60           |
| 14                | 20,2            | 0,7      | 0,5       | 11            | 39     | 77                                         | 4,2      | 30/60           |
| 15                | 21,9            | 0,7      | 0,5       | 10            | 56     | 96                                         | 5,1      | 30/60           |
| 16                | 21,9            | 0,7      | 0,5       | 10            | 53     | 96                                         | 5,1      | 30/60           |
| 17                | 24,7            | 1        | 0,5       | 9             | 83     | 144                                        | 9        | 30/60           |
| 20                | 29,3            | 1        | 0,5       | 8             | 144    | 216                                        | 14,2     | 30/60           |
| 25                | 34,2            | 1        | 0,5       | 7             | 187    | 322                                        | 20,5     | 30/60           |
| 30                | 39,8            | 1        | 0,5       | 7             | 279    | 462                                        | 28       | 30/60           |
| 35                | 45,0            | 1        | 0,5       | 7°30          | 380    | 637                                        | 38       | 40/80           |
| 40                | 50,8            | 1,5      | 0,5       | 8             | 503    | 825                                        | 49,5     | 40/80           |
| 45                | 56,0            | 1,5      | 0,5       | 8             | 660    | 1 017                                      | 63,5     | 40/80           |
| 50                | 62,3            | 1,5      | 0,5       | 7             | 986    | 1 297                                      | 82       | 40/80           |

<sup>1)</sup> Loads are given in the opposite direction to the slots and are valid for the steel/steel spherical plain bearings. For other bearings, refer to page 134

<sup>2)</sup> Values are given for non protected bearings. For sealed bearings, refer to page 140

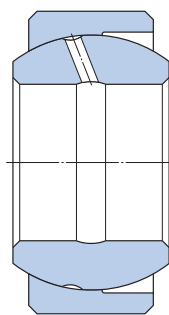
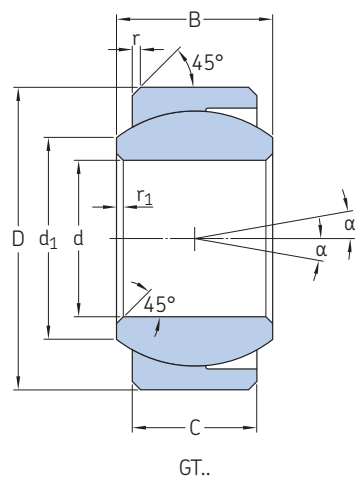
## Designation system

|                                               |                                                                         |   |   |     |    |   |     |   |    |     |     |
|-----------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|-----|---|----|-----|-----|
| Examples:                                     | ZWGLS20MRTGE-2CP6R10                                                    | Z | W | GLS | 20 | M | RTG | E | -2 | CP6 | R10 |
|                                               | QGLS12RTGEE                                                             |   |   |     |    |   |     |   |    |     |     |
| <b>Surface treatment of outer ring</b>        |                                                                         |   |   |     |    |   |     |   |    |     |     |
| No code                                       | Not plated                                                              |   |   |     |    |   |     |   |    |     |     |
| Z                                             | Cadmium plated external dimensions                                      |   |   |     |    |   |     |   |    |     |     |
| SZ                                            | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |     |   |    |     |     |
| <b>Material</b>                               |                                                                         |   |   |     |    |   |     |   |    |     |     |
| No code                                       | Bearing steel inner ring and outer ring                                 |   |   |     |    |   |     |   |    |     |     |
| W                                             | Corrosion-resistant steel inner ring and outer ring                     |   |   |     |    |   |     |   |    |     |     |
| Q                                             | Bronze beryllium inner ring and bearing steel outer ring                |   |   |     |    |   |     |   |    |     |     |
| <b>Basic designation</b>                      |                                                                         |   |   |     |    |   |     |   |    |     |     |
| <b>Bore code</b>                              |                                                                         |   |   |     |    |   |     |   |    |     |     |
| <b>Dry-lubricant</b>                          |                                                                         |   |   |     |    |   |     |   |    |     |     |
| No code                                       | No treatment                                                            |   |   |     |    |   |     |   |    |     |     |
| M                                             | With molybdenum disulfide                                               |   |   |     |    |   |     |   |    |     |     |
| <b>Seal</b>                                   |                                                                         |   |   |     |    |   |     |   |    |     |     |
| No code                                       | No seal                                                                 |   |   |     |    |   |     |   |    |     |     |
| E                                             | Sealed on the slot side                                                 |   |   |     |    |   |     |   |    |     |     |
| EE                                            | Sealed on both sides                                                    |   |   |     |    |   |     |   |    |     |     |
| <b>Lubricant</b>                              |                                                                         |   |   |     |    |   |     |   |    |     |     |
| No code                                       | Grease G354                                                             |   |   |     |    |   |     |   |    |     |     |
| -2                                            | Grease G395                                                             |   |   |     |    |   |     |   |    |     |     |
| <b>Surface treatment of inner ring sphere</b> |                                                                         |   |   |     |    |   |     |   |    |     |     |
| No code                                       | Not plated                                                              |   |   |     |    |   |     |   |    |     |     |
| CP6 <sup>1)</sup>                             | Chromium plated sphere                                                  |   |   |     |    |   |     |   |    |     |     |
| CP109 <sup>1)</sup>                           | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |     |   |    |     |     |
| CP55 <sup>1)</sup>                            | Passivated corrosion-resistant steel inner ring                         |   |   |     |    |   |     |   |    |     |     |
| <b>Oversize</b>                               |                                                                         |   |   |     |    |   |     |   |    |     |     |
| No code                                       | Standard outer diameter size                                            |   |   |     |    |   |     |   |    |     |     |
| R10                                           | 0,1 mm oversized outer diameter                                         |   |   |     |    |   |     |   |    |     |     |
| R20                                           | 0,2 mm oversized outer diameter                                         |   |   |     |    |   |     |   |    |     |     |

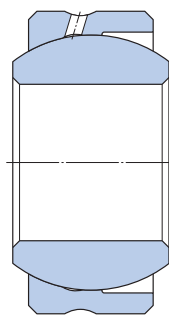
<sup>1)</sup> Available only for inner ring in corrosion-resistant steel material

## 2.4 Metal-to-metal loader slot wide (metric dimensions)

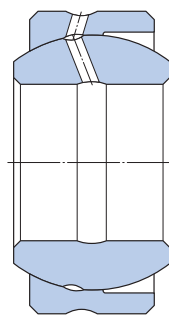
GT



GTS..



GTC..



GTy..

Technical specification

–

Product standards

–

### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$ | D  | $\Delta D_{mp}$ | C $\pm 1$ | B 0/-0,06 |
|-------------------|--------------|-----------------|----|-----------------|-----------|-----------|
| –                 | mm           | $\mu m$         | mm | $\mu m$         | mm        |           |
| 12                | 12           | 0/-8            | 25 | 0/-8            | 10        | 13        |
| 15                | 15           | 0/-8            | 29 | 0/-8            | 12        | 15        |
| 17                | 17           | 0/-8            | 31 | 0/-9            | 13,5      | 16        |
| 20                | 20           | 0/-9            | 40 | 0/-9            | 18        | 22        |
| 25                | 25           | 0/-9            | 45 | 0/-9            | 20        | 25        |
| 30                | 30           | 0/-9            | 51 | 0/-11           | 24        | 28        |
| 35                | 35           | 0/-11           | 57 | 0/-11           | 26        | 31        |
| 40                | 40           | 0/-11           | 64 | 0/-11           | 29        | 34        |
| 45                | 45           | 0/-11           | 72 | 0/-11           | 32        | 37        |
| 50                | 50           | 0/-11           | 80 | 0/-13           | 34        | 41        |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 $\approx$ | r +0,3/0 | r1 +0,3/0 | $\alpha^{2)}$ | Mass $\approx$ | Static limit loads <sup>1)</sup><br>Radial Cs | Axial Ca | Axial clearance<br>GT | GTS<br>GTC<br>GTy |
|-------------------|-------------------------|----------|-----------|---------------|----------------|-----------------------------------------------|----------|-----------------------|-------------------|
| –                 | mm                      |          |           | °             | g              | kN                                            |          | $\mu m$               |                   |
| 12                | 16,2                    | 0,5      | 0,1       | 10            | 31             | 91,8                                          | 6,2      | 5/25                  | 15/40             |
| 15                | 19,2                    | 0,5      | 0,1       | 8             | 49             | 133,8                                         | 9,4      | 5/25                  | 15/40             |
| 17                | 20,7                    | 0,5      | 0,1       | 7             | 57             | 162,6                                         | 15,7     | 5/25                  | 15/40             |
| 20                | 25,4                    | 0,7      | 0,1       | 8             | 135            | 274,8                                         | 22,6     | 10/30                 | 20/45             |
| 25                | 29,7                    | 0,7      | 0,1       | 8             | 180            | 361,8                                         | 28,5     | 10/30                 | 20/45             |
| 30                | 34,7                    | 0,7      | 0,1       | 6             | 290            | 555                                           | 45,8     | 10/30                 | 20/45             |
| 35                | 39,2                    | 0,9      | 0,1       | 7             | 325            | 684,4                                         | 54       | 15/40                 | 25/50             |
| 40                | 45,2                    | 0,9      | 0,1       | 6             | 440            | 887                                           | 67,6     | 15/40                 | 25/50             |
| 45                | 51,5                    | 0,9      | 0,1       | 5             | 605            | 1 105                                         | 83,1     | 15/40                 | 25/50             |
| 50                | 57                      | 0,9      | 0,1       | 7             | 840            | 1 304                                         | 93,6     | 15/50                 | 25/50             |

<sup>1)</sup> Loads are given in the opposite direction to the slots and are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>2)</sup> Values are given for non protected bearings. For sealed bearings, refer to page 140

## Designation system

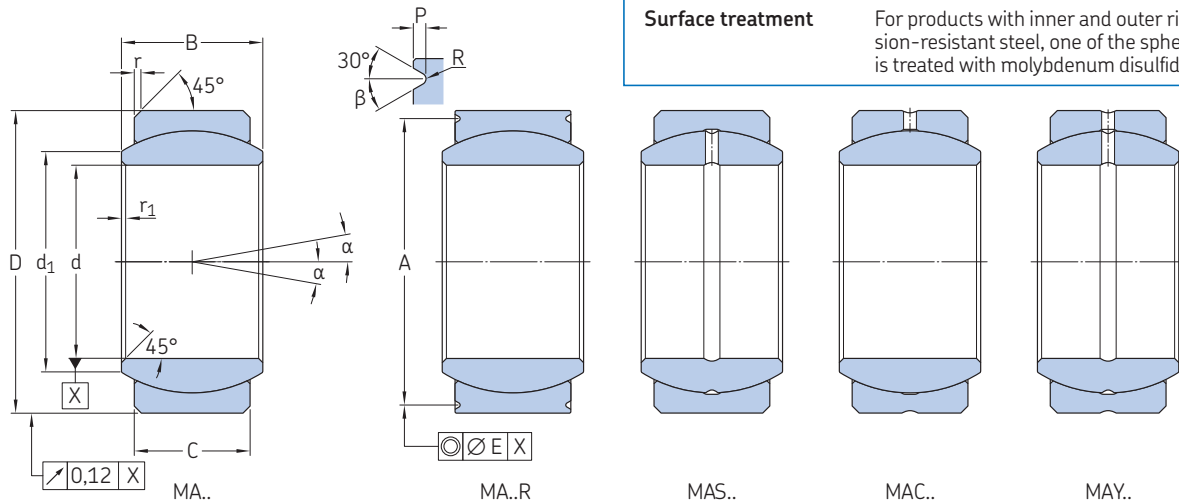
|                                                |                                                                         |   |   |    |   |    |   |    |     |     |
|------------------------------------------------|-------------------------------------------------------------------------|---|---|----|---|----|---|----|-----|-----|
| Examples:                                      | ZWGT S20E-2CP6R10                                                       | Z | W | GT | S | 20 | E | -2 | CP6 | R10 |
|                                                | QGT C30EE                                                               |   |   |    |   |    |   |    |     |     |
| <b>Surface treatment of outer ring</b>         |                                                                         |   |   |    |   |    |   |    |     |     |
| No code                                        | Not plated                                                              |   |   |    |   |    |   |    |     |     |
| Z                                              | Cadmium plated external dimensions                                      |   |   |    |   |    |   |    |     |     |
| SZ                                             | Zinc-nickel plated external dimensions                                  |   |   |    |   |    |   |    |     |     |
| <b>Material</b>                                |                                                                         |   |   |    |   |    |   |    |     |     |
| No code                                        | Bearing steel inner ring and outer ring                                 |   |   |    |   |    |   |    |     |     |
| W                                              | Corrosion-resistant steel inner ring and outer ring                     |   |   |    |   |    |   |    |     |     |
| Q                                              | Bronze beryllium inner ring and bearing steel outer ring                |   |   |    |   |    |   |    |     |     |
| <b>Basic designation</b>                       |                                                                         |   |   |    |   |    |   |    |     |     |
| <b>Lubrication grooves and axial clearance</b> |                                                                         |   |   |    |   |    |   |    |     |     |
| No code                                        | Without lubrication groove and reduced axial clearance                  |   |   |    |   |    |   |    |     |     |
| Code S                                         | Lubrication by inner ring and standard axial clearance                  |   |   |    |   |    |   |    |     |     |
| Code C                                         | Lubrication by outer ring and standard axial clearance                  |   |   |    |   |    |   |    |     |     |
| Code Y                                         | Lubrication by inner and outer ring and standard axial clearance        |   |   |    |   |    |   |    |     |     |
| <b>Bore code</b>                               |                                                                         |   |   |    |   |    |   |    |     |     |
| <b>Seal</b>                                    |                                                                         |   |   |    |   |    |   |    |     |     |
| No code                                        | No seal                                                                 |   |   |    |   |    |   |    |     |     |
| E                                              | Sealed on the slot side                                                 |   |   |    |   |    |   |    |     |     |
| EE                                             | Sealed on both sides                                                    |   |   |    |   |    |   |    |     |     |
| <b>Lubricant</b>                               |                                                                         |   |   |    |   |    |   |    |     |     |
| No code                                        | Grease G354                                                             |   |   |    |   |    |   |    |     |     |
| -2                                             | Grease G395                                                             |   |   |    |   |    |   |    |     |     |
| <b>Surface treatment of inner ring</b>         |                                                                         |   |   |    |   |    |   |    |     |     |
| No code                                        | Not plated                                                              |   |   |    |   |    |   |    |     |     |
| CP6 <sup>1)</sup>                              | Chromium plated sphere                                                  |   |   |    |   |    |   |    |     |     |
| CP109 <sup>1)</sup>                            | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |    |   |    |   |    |     |     |
| CP55 <sup>1)</sup>                             | Passivated corrosion-resistant steel inner ring                         |   |   |    |   |    |   |    |     |     |
| <b>Oversize</b>                                |                                                                         |   |   |    |   |    |   |    |     |     |
| No code                                        | Standard outer diameter size                                            |   |   |    |   |    |   |    |     |     |
| R10                                            | 0,1 mm oversized outer diameter                                         |   |   |    |   |    |   |    |     |     |
| R20                                            | 0,2 mm oversized outer diameter                                         |   |   |    |   |    |   |    |     |     |

<sup>1)</sup> Available only for inner ring in corrosion-resistant steel material

## 2.5 Metal-to-metal swaged light (metric dimensions)

MA bore code 4 to 20

**Technical specification** EN 2337  
**Product standards** EN 2335  
**Surface treatment** For products with inner and outer rings in corrosion-resistant steel, one of the spherical surfaces is treated with molybdenum disulfide



| $\beta$ | E    |
|---------|------|
| °       | mm   |
| 30      | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$ | $\Delta d_s$ | D  | $\Delta D_{mp}$ | $\Delta D_s$ | C $\pm 0.1$ | B 0/-0,06 | $d_1 \approx$ | A +0,1/0 Code R | Code PR |
|-------------------|--------------|-----------------|--------------|----|-----------------|--------------|-------------|-----------|---------------|-----------------|---------|
| –                 | mm           | $\mu m$         |              | mm | $\mu m$         |              | mm          |           |               |                 |         |
| 4                 | 4            | 0/-8            | +3/-10       | 12 | 0/-8            | +5/-13       | 3           | 5         | 6,2           | –               | –       |
| 5                 | 5            | 0/-8            | +3/-10       | 14 | 0/-8            | +5/-13       | 4           | 6         | 8             | –               | –       |
| 6                 | 6            | 0/-8            | +3/-10       | 14 | 0/-8            | +5/-13       | 4           | 6         | 8             | –               | –       |
| 8                 | 8            | 0/-8            | +3/-10       | 16 | 0/-8            | +5/-13       | 5           | 8         | 10,2          | 14,2            | –       |
| 10                | 10           | 0/-8            | +3/-10       | 19 | 0/-9            | +6/-15       | 6           | 9         | 13,2          | 17,2            | –       |
| 12                | 12           | 0/-8            | +3/-11       | 22 | 0/-9            | +6/-15       | 7           | 10        | 15            | 20,2            | –       |
| 15                | 15           | 0/-8            | +3/-11       | 26 | 0/-9            | +6/-15       | 9           | 12        | 18,7          | 24,2            | 24      |
| 17                | 17           | 0/-8            | +3/-11       | 30 | 0/-11           | +8/-19       | 10          | 14        | 21,2          | 28,2            | 28      |
| 20                | 20           | 0/-10           | +3/-13       | 35 | 0/-11           | +8/-19       | 12          | 16        | 24,9          | 33,2            | 33      |

### Dimensions cont., loads and clearance

| Nominal<br>bore<br>code | Dimensions       |                   |     | r       | r <sub>1</sub> | α <sup>(4)</sup> | Mass<br>≈ | Static limit loads <sup>3)</sup> |                              | Axial clearance |          | Radial clearance Max |          |
|-------------------------|------------------|-------------------|-----|---------|----------------|------------------|-----------|----------------------------------|------------------------------|-----------------|----------|----------------------|----------|
|                         | P                | R                 |     |         |                |                  |           | Radial                           | Axial                        | Reduced         | Standard | Reduced              | Standard |
|                         | 0/-0,2<br>Code R | +0,1/0<br>Code PR |     |         |                |                  |           | C <sub>s</sub>                   | C <sub>a</sub> <sup>2)</sup> |                 |          |                      |          |
| –                       | mm               |                   |     |         |                | °                | g         | kN                               |                              | µm              |          |                      |          |
| 4                       | –                | –                 | –   | 0,4/0,7 | 0,3/0,6        | 16               | 3         | 7,2                              | 0,45                         | 5/35            | 35/75    | 10                   | 20       |
| 5                       | –                | –                 | –   | 0,4/0,7 | 0,3/0,6        | 13               | 4         | 12,6                             | 0,8                          | 5/35            | 35/75    | 10                   | 20       |
| 6                       | –                | –                 | –   | 0,4/0,7 | 0,3/0,6        | 13               | 4         | 16                               | 1                            | 5/35            | 35/75    | 10                   | 20       |
| 8                       | 0,7              | –                 | 0,2 | 0,5/0,8 | 0,3/0,6        | 15               | 8         | 21                               | 1,8                          | 5/35            | 35/75    | 10                   | 20       |
| 10                      | 0,7              | –                 | 0,2 | 0,5/0,8 | 0,5/0,8        | 15               | 12        | 31                               | 2,5                          | 5/35            | 35/75    | 10                   | 20       |
| 12                      | 0,7              | –                 | 0,2 | 0,6/1   | 0,5/0,8        | 11               | 17        | 40,5                             | 3,5                          | 5/35            | 35/75    | 10                   | 20       |
| 15                      | 0,7              | 0,9               | 0,2 | 0,6/1   | 0,5/0,8        | 9                | 32        | 70                               | 5,3                          | 5/35            | 35/75    | 10                   | 20       |
| 17                      | 0,7              | 0,9               | 0,2 | 0,9/1.3 | 0,5/0,8        | 10               | 49        | 91,4                             | 6,7                          | 5/40            | 40/80    | 12                   | 25       |
| 20                      | 0,7              | 0,9               | 0,2 | 0,9/1.3 | 0,5/0,8        | 9                | 65        | 130                              | 9,8                          | 5/40            | 40/80    | 12                   | 25       |

<sup>2)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>3)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## Designation system

|                                        |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
|----------------------------------------|-------------------------------------------------------------------------|---------------------------|----|----|---|----|---|---|----|----|-----|-----|
| Examples:                              | ZWQMAS20RXTT-2CP6R10                                                    | Z                         | WQ | MA | S | 20 | R | X | TT | -2 | CP6 | R10 |
|                                        | QMAC15PPCP109                                                           |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of outer ring</b> |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                           |    |    |   |    |   |   |    |    |     |     |
| Z <sup>1)</sup>                        | Cadmium plated external dimensions                                      |                           |    |    |   |    |   |   |    |    |     |     |
| SZ <sup>1)</sup>                       | Zinc-nickel plated external dimensions                                  |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Material code</b>                   |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| W                                      | Inner ring material                                                     | Outer ring material       |    |    |   |    |   |   |    |    |     |     |
| Q <sup>1)</sup>                        | Corrosion-resistant steel                                               | Corrosion-resistant steel |    |    |   |    |   |   |    |    |     |     |
| WQ <sup>1)</sup>                       | Bronze beryllium                                                        | Corrosion-resistant steel |    |    |   |    |   |   |    |    |     |     |
|                                        | Corrosion-resistant steel                                               | Bronze aluminium          |    |    |   |    |   |   |    |    |     |     |
| <b>Basic designation</b>               |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Lubrication grooves</b>             |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| No code                                | Without lubrication groove                                              |                           |    |    |   |    |   |   |    |    |     |     |
| S <sup>3)</sup>                        | Lubrication by inner ring                                               |                           |    |    |   |    |   |   |    |    |     |     |
| C <sup>3)</sup> 6)                     | Lubrication by outer ring                                               |                           |    |    |   |    |   |   |    |    |     |     |
| Y <sup>3)</sup>                        | Lubrication by inner and outer ring                                     |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Bore code</b>                       |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Chamfer and groove</b>              |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| No code                                | Chamfered outer ring                                                    |                           |    |    |   |    |   |   |    |    |     |     |
| R or PR <sup>2)</sup>                  | Grooved outer ring                                                      |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Clearances</b>                      |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| No code                                | Standard clearances                                                     |                           |    |    |   |    |   |   |    |    |     |     |
| X                                      | Reduced clearances                                                      |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Shield and seal</b>                 |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| No code                                | No shield and seal                                                      |                           |    |    |   |    |   |   |    |    |     |     |
| TT <sup>1)</sup> 7)                    | Sealed                                                                  |                           |    |    |   |    |   |   |    |    |     |     |
| PP <sup>1)</sup> 7)                    | Shielded                                                                |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Lubricant</b>                       |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| No code                                | Grease G354                                                             |                           |    |    |   |    |   |   |    |    |     |     |
| -2                                     | Grease G395                                                             |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of inner ring</b> |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                           |    |    |   |    |   |   |    |    |     |     |
| CP6 <sup>5)</sup>                      | Chromium plated sphere                                                  |                           |    |    |   |    |   |   |    |    |     |     |
| CP109 <sup>5)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |                           |    |    |   |    |   |   |    |    |     |     |
| CP55 <sup>4)</sup>                     | Passivated corrosion-resistant steel inner ring                         |                           |    |    |   |    |   |   |    |    |     |     |
| <b>Oversize</b>                        |                                                                         |                           |    |    |   |    |   |   |    |    |     |     |
| No code                                | Standard outer diameter size                                            |                           |    |    |   |    |   |   |    |    |     |     |
| R10 <sup>1)</sup>                      | 0,1 mm oversized outer diameter                                         |                           |    |    |   |    |   |   |    |    |     |     |
| R20 <sup>1)</sup>                      | 0,2 mm oversized outer diameter                                         |                           |    |    |   |    |   |   |    |    |     |     |

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option for bore code  $\geq 8$  and  $\leq 10$

<sup>3)</sup> SKF option for bore code  $\leq 12$

<sup>4)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>5)</sup> SKF option, available only for inner ring in corrosion-resistant steel material

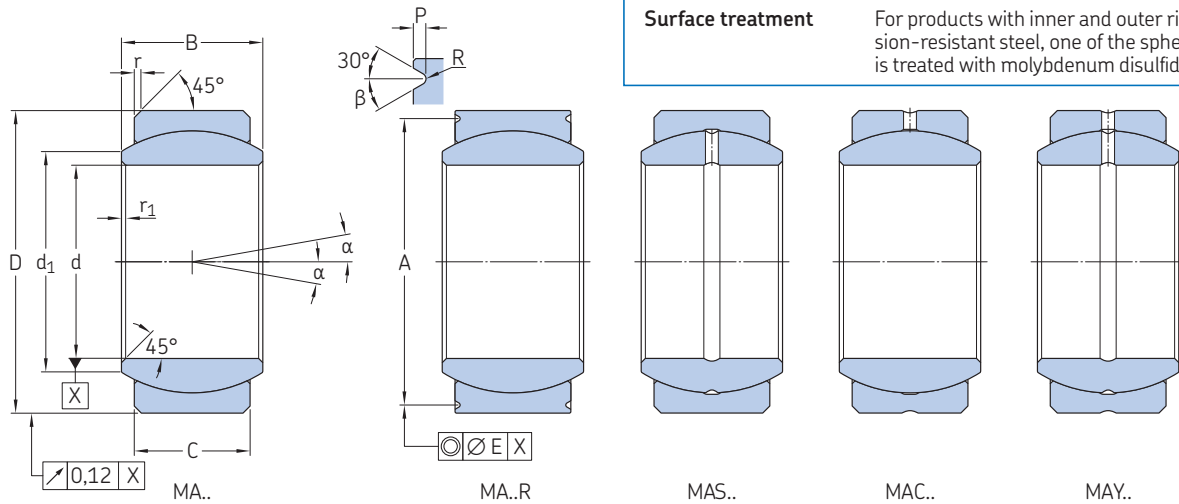
<sup>6)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 6$

<sup>7)</sup> Only available for  $d \geq 6$

## 2.5 Metal-to-metal swaged light (metric dimensions)

MA bore code 25 to 70

**Technical specification** EN 2337  
**Product standards** EN 2335  
**Surface treatment** For products with inner and outer rings in corrosion-resistant steel, one of the spherical surfaces is treated with molybdenum disulfide



| $\beta$ | E    |
|---------|------|
| °       | mm   |
| 30      | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$ | $\Delta d_s$ | D   | $\Delta D_{mp}$ | $\Delta D_s$ | C $\pm 0,1$ | B 0/-0,06 | $d_1 \approx$ | A +0,1/0 Code R | Code PR |
|-------------------|--------------|-----------------|--------------|-----|-----------------|--------------|-------------|-----------|---------------|-----------------|---------|
| –                 | mm           | $\mu m$         |              | mm  | $\mu m$         |              | mm          |           |               |                 |         |
| 25                | 25           | 0/-10           | +3/-13       | 42  | 0/-11           | +8/-19       | 16          | 20        | 30            | 39,4            | 38,8    |
| 30                | 30           | 0/-10           | +3/-13       | 47  | 0/-11           | +8/-19       | 18          | 22        | 34,3          | 44,4            | 43,8    |
| 35                | 35           | 0/-12           | +3/-15       | 55  | 0/-13           | +10/-23      | 20          | 25        | 40,5          | 51,8            | –       |
| 40                | 40           | 0/-12           | +3/-15       | 62  | 0/-13           | +10/-23      | 22          | 28        | 45            | 58,8            | –       |
| 45                | 45           | 0/-12           | +3/-15       | 68  | 0/-13           | +10/-23      | 25          | 32        | 51,3          | 64,8            | –       |
| 50                | 50           | 0/-12           | +3/-15       | 75  | 0/-13           | +10/-23      | 28          | 35        | 58,2          | 71,8            | –       |
| 60                | 60           | 0/-15           | +4/-19       | 90  | 0/-15           | +13/-28      | 36          | 44        | 66,8          | 86,8            | –       |
| 70 <sup>1)</sup>  | 70           | 0/-15           | +4/-19       | 105 | 0/-15           | +13/-28      | 40          | 49        | 77,8          | 101,8           | –       |

### Dimensions cont., loads and clearance

| Nominal<br>bore<br>code | Dimensions       |         |        |         |                | $\alpha^{4)}$ | Mass<br>≈ | Static limit loads <sup>3)</sup> |                                       | Axial clearance |          | Radial clearance Max |          |
|-------------------------|------------------|---------|--------|---------|----------------|---------------|-----------|----------------------------------|---------------------------------------|-----------------|----------|----------------------|----------|
|                         | P                |         | R      | r       | r <sub>1</sub> |               |           | Radial<br>C <sub>s</sub>         | Axial<br>C <sub>a</sub> <sup>2)</sup> | Reduced         | Standard | Reduced              | Standard |
|                         | 0/-0,2<br>Code R | Code PR | +0,1/0 |         |                |               |           |                                  |                                       |                 |          |                      |          |
| –                       | mm               |         |        |         |                | °             | g         | kN                               |                                       | μm              |          |                      |          |
| 25                      | 0,9              | 1,4     | 0,3    | 0,9/1,3 | 0,5/0,8        | 7             | 115       | 216,7                            | 18                                    | 5/50            | 50/100   | 15                   | 30       |
| 30                      | 0,9              | 1,4     | 0,3    | 0,9/1,3 | 0,5/0,8        | 6             | 160       | 277,5                            | 25                                    | 5/50            | 50/100   | 15                   | 30       |
| 35                      | 1,4              | –       | 0,3    | 0,9/1,3 | 0,6/1          | 7             | 229       | 359,9                            | 31                                    | 5/50            | 50/100   | 15                   | 30       |
| 40                      | 1,4              | –       | 0,3    | 1,4/1,8 | 0,6/1          | 7             | 315       | 428,8                            | 38                                    | 5/50            | 50/100   | 15                   | 30       |
| 45                      | 1,4              | –       | 0,3    | 1,4/1,8 | 0,6/1          | 7             | 460       | 558,4                            | 50                                    | 5/60            | 60/120   | 20                   | 35       |
| 50                      | 1,4              | –       | 0,3    | 1,4/1,8 | 1,2/1,7        | 7             | 560       | 760,1                            | 64                                    | 5/60            | 60/120   | 20                   | 35       |
| 60                      | 1,4              | –       | 0,3    | 1,4/1,8 | 1,2/1,7        | 6             | 1100      | 1056                             | 104                                   | 5/60            | 60/120   | 20                   | 35       |
| 70 <sup>1)</sup>        | 1,4              | –       | 0,3    | 1,4/1,8 | 1,2/1,7        | 6             | 1540      | 1361,6                           | 197,3                                 | 5/60            | 60/120   | 20                   | 35       |

1) SKF option

2) These values can be limited by the unstaking load (contact SKF for more information)

3) Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

4) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140





## Designation system

Examples: ZWQMAS20RXTT-2CP6R10  
QMAC15PPCP109

Z WQ MA S 20 R X TT -2 CP6 R10

### Surface treatment of outer ring

**No code** Not plated  
**Z**<sup>1)</sup> Cadmium plated external dimensions  
**SZ**<sup>1)</sup> Zinc-nickel plated external dimensions

**Material code** **Inner ring material** **Outer ring material**  
**W** Corrosion-resistant steel Corrosion-resistant steel  
**Q**<sup>1)</sup> Bronze beryllium Corrosion-resistant steel  
**WQ**<sup>1)</sup> Corrosion-resistant steel Bronze aluminium

### Basic designation

#### Lubrication grooves

**No code** Without lubrication groove  
**S**<sup>3)</sup> Lubrication by inner ring  
**C**<sup>3)</sup> <sup>6)</sup> Lubrication by outer ring  
**Y**<sup>3)</sup> Lubrication by inner and outer ring

#### Bore code

#### Chamfer and groove

**No code** Chamfered outer ring  
**R or PR**<sup>2)</sup> Grooved outer ring

#### Clearances

**No code** Standard clearances  
**X** Reduced clearances

#### Shield and seal

**No code** No shield and seal  
**TT**<sup>1)</sup> <sup>7)</sup> Sealed  
**PP**<sup>1)</sup> <sup>7)</sup> Shielded

#### Lubricant

**No code** Grease G354  
**-2** Grease G395

#### Surface treatment of inner ring

**No code** Not plated  
**CP6**<sup>5)</sup> Chromium plated sphere  
**CP109**<sup>5)</sup> XCR plating on sphere (chromium 6 free replacement to chromium plating)  
**CP55**<sup>4)</sup> Passivated corrosion-resistant steel inner ring

#### Oversize

**No code** Standard outer diameter size  
**R10**<sup>1)</sup> 0,1 mm oversized outer diameter  
**R20**<sup>1)</sup> 0,2 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option for bore code  $\geq 8$  and  $\leq 10$

<sup>3)</sup> SKF option for bore code  $\leq 12$

<sup>4)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>5)</sup> SKF option, available only for inner ring in corrosion-resistant steel material

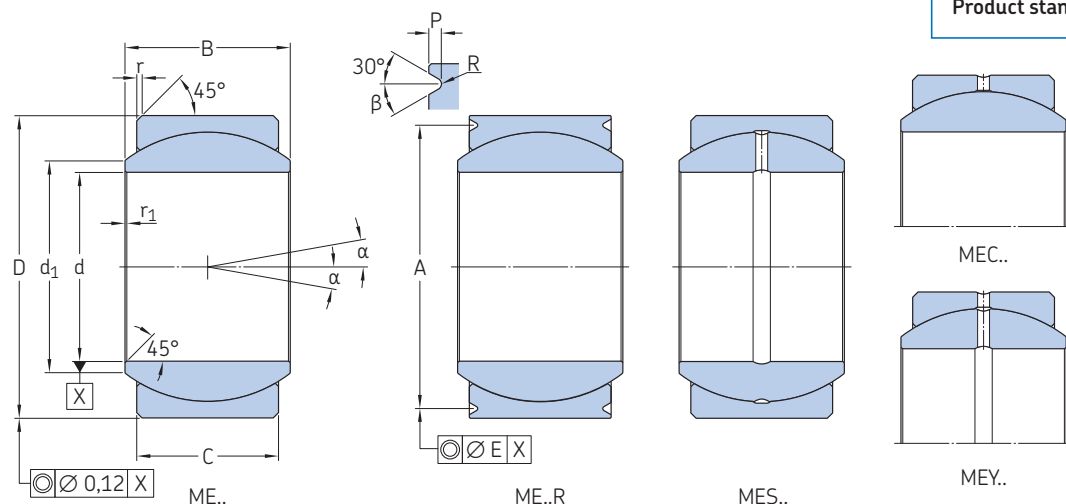
<sup>6)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 6$

<sup>7)</sup> Only available for  $d \geq 6$

## 2.6 Metal-to-metal swaged narrow (metric dimensions)

ME bore code 5 to 20

Technical specification –  
Product standards –



| d    | β  | E    |
|------|----|------|
| mm   | °  | mm   |
| ≤ 8  | 20 | 0,08 |
| ≥ 10 | 30 | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d | Δdmp  | D  | ΔDmp  | C ±0,1 | B 0/-0,06 |
|-------------------|--------------|-------|----|-------|--------|-----------|
| –                 | mm           | μm    | mm | μm    | mm     |           |
| 5                 | 5            | 0/-8  | 14 | 0/-8  | 5,5    | 7         |
| 6                 | 6            | 0/-8  | 16 | 0/-8  | 6,5    | 9         |
| 8                 | 8            | 0/-8  | 18 | 0/-8  | 7      | 10        |
| 10                | 10           | 0/-8  | 21 | 0/-9  | 8      | 10,5      |
| 12                | 12           | 0/-8  | 25 | 0/-9  | 10     | 13        |
| 15                | 15           | 0/-8  | 29 | 0/-9  | 12     | 15        |
| 17                | 17           | 0/-8  | 31 | 0/-9  | 13,5   | 16        |
| 20                | 20           | 0/-10 | 40 | 0/-11 | 18     | 22        |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 ≈ | A +0,1/0 | P 0/-0,2 | R +0,1/0 | r       | r1 +0,3/0 | α <sup>3)</sup> | Mass ≈ | Static limit loads <sup>2)</sup> Radial Cs | Axial Ca <sup>1)</sup> | Axial clearance Reduced | Standard |
|-------------------|-----------------|----------|----------|----------|---------|-----------|-----------------|--------|--------------------------------------------|------------------------|-------------------------|----------|
| –                 | mm              |          |          |          |         |           | °               | g      | kN                                         |                        | μm                      |          |
| 5                 | 8,6             | 12,2     | 0,7      | 0,2      | 0,5/0,8 | 0,1       | 9               | 7      | 20,5                                       | 1,9                    | 5/35                    | 35/75    |
| 6                 | 9               | 14,2     | 0,7      | 0,2      | 0,5/0,8 | 0,1       | 14              | 9      | 29,2                                       | 3,5                    | 5/35                    | 35/75    |
| 8                 | 10,2            | 16,2     | 0,7      | 0,2      | 0,5/0,8 | 0,1       | 15              | 12     | 37                                         | 3,9                    | 5/35                    | 35/75    |
| 10                | 11,9            | 18,4     | 0,9      | 0,3      | 0,5/0,8 | 0,1       | 11              | 20     | 47,2                                       | 6,5                    | 5/35                    | 35/75    |
| 12                | 15              | 22,4     | 0,9      | 0,3      | 0,5/0,8 | 0,1       | 10              | 32     | 78,1                                       | 11,7                   | 5/35                    | 35/75    |
| 15                | 20,5            | 26,4     | 0,9      | 0,3      | 0,5/0,8 | 0,1       | 8               | 50     | 121,9                                      | 18                     | 5/35                    | 35/75    |
| 17                | 21,7            | 28,4     | 0,9      | 0,3      | 0,5/0,8 | 0,1       | 7               | 59     | 148,3                                      | 24,3                   | 5/40                    | 40/80    |
| 20                | 27,1            | 36,8     | 1,4      | 0,3      | 0,6/1   | 0,1       | 8               | 135    | 268,6                                      | 45,5                   | 5/40                    | 40/80    |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## Designation system

|                                        |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
|----------------------------------------|-------------------------------------------------------------------------|----------------------------|---------------------------|----|---|----|---|---|----|----|-----|-----|
| Examples:                              | ZWQMES22RXTT-2CP6R10                                                    | Z                          | WQ                        | ME | S | 22 | R | X | TT | -2 | CP6 | R10 |
|                                        | QMEC30PPCP109                                                           |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of outer ring</b> |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| Z                                      | Cadmium plated external dimensions                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| SZ                                     | Zinc-nickel plated external dimensions                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Material code</b>                   |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Inner ring material</b>             |                                                                         | <b>Outer ring material</b> |                           |    |   |    |   |   |    |    |     |     |
| W                                      | Corrosion-resistant steel                                               |                            | Corrosion-resistant steel |    |   |    |   |   |    |    |     |     |
| Q                                      | Bronze beryllium                                                        |                            | Corrosion-resistant steel |    |   |    |   |   |    |    |     |     |
| WQ                                     | Corrosion-resistant steel                                               |                            | Bronze aluminium          |    |   |    |   |   |    |    |     |     |
| <b>Basic designation</b>               |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Lubrication grooves</b>             |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Without lubrication groove                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| S                                      | Lubrication by inner ring                                               |                            |                           |    |   |    |   |   |    |    |     |     |
| C <sup>3)</sup>                        | Lubrication by outer ring                                               |                            |                           |    |   |    |   |   |    |    |     |     |
| Y                                      | Lubrication by inner and outer ring                                     |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Bore code</b>                       |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Chamfer and groove</b>              |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Chamfered outer ring                                                    |                            |                           |    |   |    |   |   |    |    |     |     |
| R                                      | Grooved outer ring                                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Axial clearance</b>                 |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Standard axial clearance                                                |                            |                           |    |   |    |   |   |    |    |     |     |
| X                                      | Reduced axial clearance                                                 |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Shield and seal</b>                 |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | No shield and seal                                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| TT <sup>4)</sup>                       | Sealed                                                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| PP <sup>4)</sup>                       | Shielded                                                                |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Lubricant</b>                       |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Grease G354                                                             |                            |                           |    |   |    |   |   |    |    |     |     |
| -2                                     | Grease G395                                                             |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of inner ring</b> |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| CP6 <sup>2)</sup>                      | Chromium plated sphere                                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| CP109 <sup>2)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |                            |                           |    |   |    |   |   |    |    |     |     |
| CP55 <sup>2)</sup>                     | Passivated corrosion-resistant steel inner ring                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Oversize</b>                        |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Standard outer diameter size                                            |                            |                           |    |   |    |   |   |    |    |     |     |
| R10                                    | 0,1 mm oversized outer diameter                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| R20                                    | 0,2 mm oversized outer diameter                                         |                            |                           |    |   |    |   |   |    |    |     |     |

<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 6$

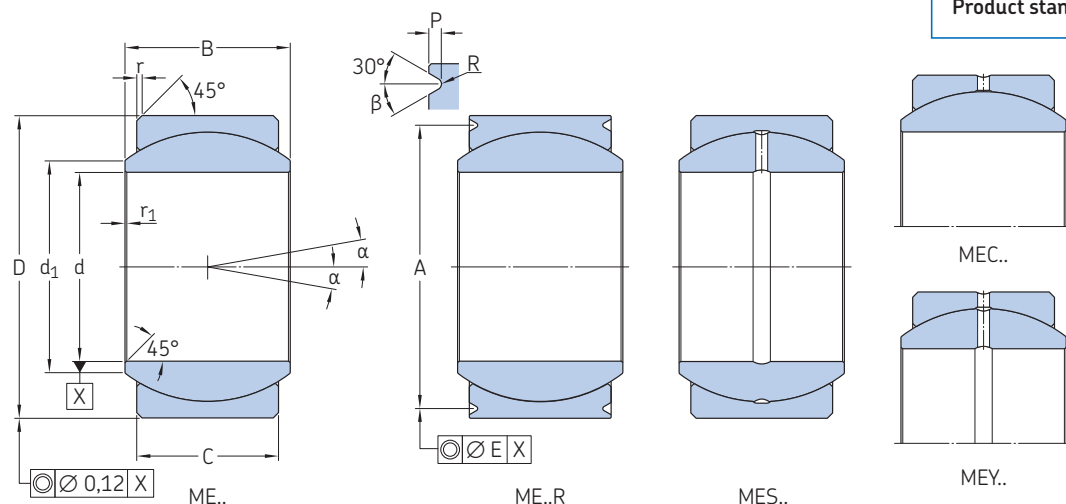
<sup>4)</sup> Only available for  $d \geq 6$

## 2.6 Metal-to-metal swaged narrow (metric dimensions)

ME bore code 22 to 50

Technical specification –

Product standards –



| d    | β  | E    |
|------|----|------|
| mm   | °  | mm   |
| ≤ 8  | 20 | 0,08 |
| ≥ 10 | 30 | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d | Δdmp  | D  | ΔDmp  | C ±0,1 | B 0/-0,06 |
|-------------------|--------------|-------|----|-------|--------|-----------|
| –                 | mm           | μm    | mm | μm    | mm     |           |
| 22                | 22           | 0/-10 | 40 | 0/-11 | 18     | 22        |
| 25                | 25           | 0/-10 | 45 | 0/-11 | 20     | 25        |
| 30                | 30           | 0/-10 | 51 | 0/-13 | 24     | 28        |
| 35                | 35           | 0/-12 | 57 | 0/-13 | 26     | 31        |
| 40                | 40           | 0/-12 | 64 | 0/-13 | 29     | 34        |
| 45                | 45           | 0/-12 | 72 | 0/-13 | 32     | 37        |
| 50                | 50           | 0/-12 | 80 | 0/-15 | 34     | 41        |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 ≈ | A +0,1/0 | P 0/-0,2 | R +0,1/0 | r       | r1 +0,3/0 | α <sup>3)</sup> | Mass ≈ | Static limit loads <sup>2)</sup> Radial Cs | Axial Ca <sup>1)</sup> | Axial clearance Reduced | Standard |
|-------------------|-----------------|----------|----------|----------|---------|-----------|-----------------|--------|--------------------------------------------|------------------------|-------------------------|----------|
| –                 | mm              |          |          |          |         |           | °               | g      | kN                                         |                        | μm                      |          |
| 22                | 27,1            | 36,8     | 1,4      | 0,3      | 0,6/1   | 0,1       | 8               | 126    | 268,6                                      | 45,5                   | 5/40                    | 40/80    |
| 25                | 29,6            | 41,8     | 1,4      | 0,3      | 0,6/1   | 0,1       | 8               | 185    | 324,7                                      | 55,9                   | 5/50                    | 50/100   |
| 30                | 35,5            | 47,8     | 1,4      | 0,3      | 0,6/1   | 0,1       | 6               | 300    | 433,4                                      | 77,8                   | 5/50                    | 50/100   |
| 35                | 41,7            | 53,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 7               | 340    | 543,4                                      | 92,2                   | 5/50                    | 50/100   |
| 40                | 47              | 60,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 6               | 460    | 680,9                                      | 113,4                  | 5/50                    | 50/100   |
| 45                | 52,2            | 68,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 5               | 630    | 833,9                                      | 135,9                  | 5/60                    | 60/120   |
| 50                | 59,2            | 76,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 7               | 870    | 981,4                                      | 154,2                  | 5/60                    | 60/120   |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## Designation system

|                                        |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
|----------------------------------------|---------------------------------------|-------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|----------------------------|----|----|---|----|---|---|----|----|-----|-----|
| Examples:                              | ZWQMES22RXTT-2CP6R10<br>QMEC30PPCP109 |                                                                         |  |  |  |  |  |  |  |  |  | Z                          | WQ | ME | S | 22 | R | X | TT | -2 | CP6 | R10 |
| <b>Surface treatment of outer ring</b> |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>No code</b>                         |                                       | Not plated                                                              |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Z</b>                               |                                       | Cadmium plated external dimensions                                      |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>SZ</b>                              |                                       | Zinc-nickel plated external dimensions                                  |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Material code</b>                   |                                       | <b>Inner ring material</b>                                              |  |  |  |  |  |  |  |  |  | <b>Outer ring material</b> |    |    |   |    |   |   |    |    |     |     |
| <b>W</b>                               |                                       | Corrosion-resistant steel                                               |  |  |  |  |  |  |  |  |  | Corrosion-resistant steel  |    |    |   |    |   |   |    |    |     |     |
| <b>Q</b>                               |                                       | Bronze beryllium                                                        |  |  |  |  |  |  |  |  |  | Corrosion-resistant steel  |    |    |   |    |   |   |    |    |     |     |
| <b>WQ</b>                              |                                       | Corrosion-resistant steel                                               |  |  |  |  |  |  |  |  |  | Bronze aluminium           |    |    |   |    |   |   |    |    |     |     |
| <b>Basic designation</b>               |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Lubrication grooves</b>             |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>No code</b>                         |                                       | Without lubrication groove                                              |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>S</b>                               |                                       | Lubrication by inner ring                                               |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>C<sup>3)</sup></b>                  |                                       | Lubrication by outer ring                                               |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Y</b>                               |                                       | Lubrication by inner and outer ring                                     |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Bore code</b>                       |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Chamfer and groove</b>              |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>No code</b>                         |                                       | Chamfered outer ring                                                    |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>R</b>                               |                                       | Grooved outer ring                                                      |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Axial clearance</b>                 |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>No code</b>                         |                                       | Standard axial clearance                                                |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>X</b>                               |                                       | Reduced axial clearance                                                 |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Shield and seal</b>                 |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>No code</b>                         |                                       | No shield and seal                                                      |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>TT<sup>4)</sup></b>                 |                                       | Sealed                                                                  |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>PP<sup>4)</sup></b>                 |                                       | Shielded                                                                |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Lubricant</b>                       |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>No code</b>                         |                                       | Grease G354                                                             |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>-2</b>                              |                                       | Grease G395                                                             |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of inner ring</b> |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>No code</b>                         |                                       | Not plated                                                              |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>CP6<sup>2)</sup></b>                |                                       | Chromium plated sphere                                                  |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>CP109<sup>2)</sup></b>              |                                       | XCR plating on sphere (chromium 6 free replacement to chromium plating) |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>CP55<sup>2)</sup></b>               |                                       | Passivated corrosion-resistant steel inner ring                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>Oversize</b>                        |                                       |                                                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>No code</b>                         |                                       | Standard outer diameter size                                            |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>R10</b>                             |                                       | 0,1 mm oversized outer diameter                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |
| <b>R20</b>                             |                                       | 0,2 mm oversized outer diameter                                         |  |  |  |  |  |  |  |  |  |                            |    |    |   |    |   |   |    |    |     |     |

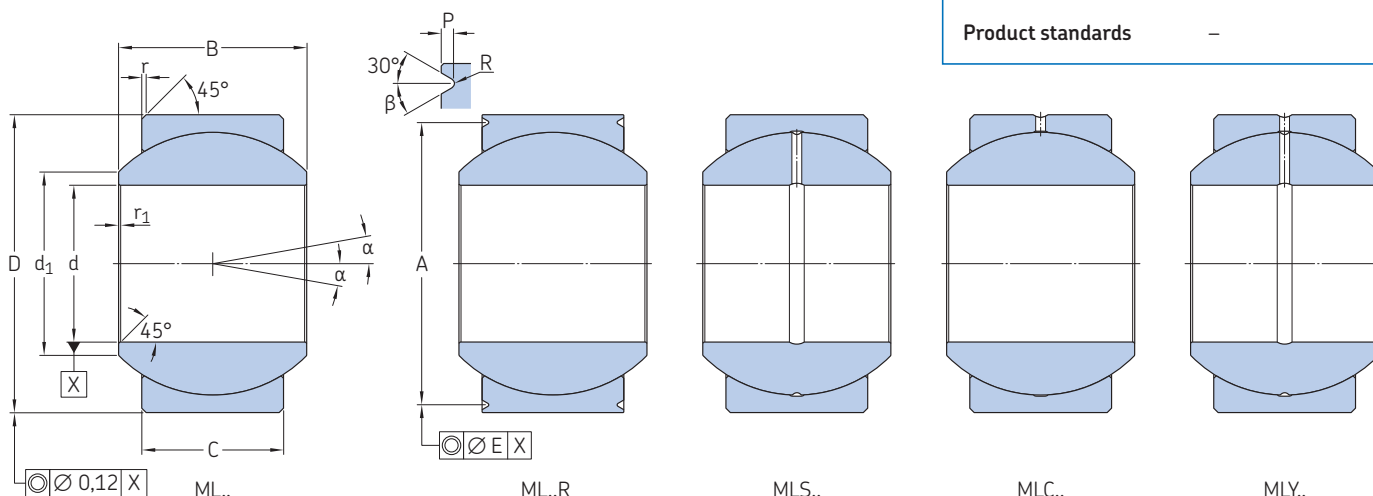
<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 6$

<sup>4)</sup> Only available for  $d \geq 6$

## 2.7 Metal-to-metal swaged wide (metric dimensions)

ML bore code **5** to **20**



Technical specification –  
Product standards –

| d    | β  | E    |
|------|----|------|
| mm   | °  | mm   |
| ≤ 6  | 20 | 0,08 |
| = 8  | 30 | 0,08 |
| ≥ 10 | 30 | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d | Δdmp  | D  | ΔDmp  | C ±0,1 | B 0/-0,06 |
|-------------------|--------------|-------|----|-------|--------|-----------|
| –                 | mm           | μm    | mm | μm    | mm     |           |
| <b>5</b>          | 5            | 0/-8  | 16 | 0/-8  | 8,5    | 11        |
| <b>6</b>          | 6            | 0/-8  | 16 | 0/-8  | 8,5    | 11        |
| <b>8</b>          | 8            | 0/-8  | 18 | 0/-8  | 8      | 11        |
| <b>10</b>         | 10           | 0/-8  | 21 | 0/-9  | 10     | 12,5      |
| <b>12</b>         | 12           | 0/-8  | 26 | 0/-9  | 13     | 16        |
| <b>15</b>         | 15           | 0/-8  | 29 | 0/-9  | 13,5   | 17        |
| <b>17</b>         | 17           | 0/-8  | 30 | 0/-9  | 14,5   | 18        |
| <b>20</b>         | 20           | 0/-10 | 35 | 0/-11 | 16     | 20        |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 ≈ | A +0,1/0 | P 0/-0,2 | R +0,1/0 | r       | r1 +0,3/0 | α <sup>3)</sup> | Mass ≈ | Static limit loads <sup>2)</sup> Radial Cs | Axial Ca <sup>1)</sup> | Axial clearance Reduced | Standard |
|-------------------|-----------------|----------|----------|----------|---------|-----------|-----------------|--------|--------------------------------------------|------------------------|-------------------------|----------|
| –                 | mm              |          |          |          |         |           | °               | g      | kN                                         |                        | μm                      |          |
| <b>5</b>          | 7,7             | 14,2     | 0,7      | 0,2      | 0,5/0,8 | 0,1       | 15              | 16     | 42,6                                       | 7,2                    | 5/35                    | 35/75    |
| <b>6</b>          | 7,7             | 14,2     | 0,7      | 0,2      | 0,5/0,8 | 0,1       | 15              | 16     | 42,6                                       | 7,2                    | 5/35                    | 35/75    |
| <b>8</b>          | 10,3            | 16,2     | 0,7      | 0,2      | 0,5/0,8 | 0,1       | 14              | 17     | 45,7                                       | 6,4                    | 5/35                    | 35/75    |
| <b>10</b>         | 12,2            | 18,4     | 0,9      | 0,3      | 0,5/0,8 | 0,1       | 10              | 27     | 68,7                                       | 11,7                   | 5/35                    | 35/75    |
| <b>12</b>         | 15,5            | 23,4     | 0,9      | 0,3      | 0,5/0,8 | 0,1       | 10              | 49     | 116,4                                      | 21,5                   | 5/35                    | 35/75    |
| <b>15</b>         | 18,9            | 26,4     | 0,9      | 0,3      | 0,5/0,8 | 0,1       | 9               | 62     | 139                                        | 24,1                   | 5/35                    | 35/75    |
| <b>17</b>         | 20,1            | 27,4     | 0,9      | 0,3      | 0,5/0,8 | 0,1       | 9               | 69     | 159,1                                      | 29                     | 5/40                    | 40/80    |
| <b>20</b>         | 23,5            | 31,8     | 1,4      | 0,3      | 0,5/0,8 | 0,1       | 8               | 104    | 207,5                                      | 36                     | 5/40                    | 40/80    |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## Designation system

|                                        |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
|----------------------------------------|-------------------------------------------------------------------------|----------------------------|---------------------------|----|---|----|---|---|----|----|-----|-----|
| Examples:                              | ZWQMLS20RXTT-2CP6R10                                                    | Z                          | WQ                        | ML | S | 20 | R | X | TT | -2 | CP6 | R10 |
|                                        | QMLC30PPCP109                                                           |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of outer ring</b> |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| Z                                      | Cadmium plated external dimensions                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| SZ                                     | Zinc-nickel plated external dimensions                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Material code</b>                   |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Inner ring material</b>             |                                                                         | <b>Outer ring material</b> |                           |    |   |    |   |   |    |    |     |     |
| W                                      | Corrosion-resistant steel                                               |                            | Corrosion-resistant steel |    |   |    |   |   |    |    |     |     |
| Q                                      | Bronze beryllium                                                        |                            | Corrosion-resistant steel |    |   |    |   |   |    |    |     |     |
| WQ                                     | Corrosion-resistant steel                                               |                            | Bronze aluminium          |    |   |    |   |   |    |    |     |     |
| <b>Basic designation</b>               |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Lubrication grooves</b>             |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Without lubrication groove                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| S                                      | Lubrication by inner ring                                               |                            |                           |    |   |    |   |   |    |    |     |     |
| C <sup>3)</sup>                        | Lubrication by outer ring                                               |                            |                           |    |   |    |   |   |    |    |     |     |
| Y                                      | Lubrication by inner and outer ring                                     |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Bore code</b>                       |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Chamfer and groove</b>              |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Chamfered outer ring                                                    |                            |                           |    |   |    |   |   |    |    |     |     |
| R                                      | Grooved outer ring                                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Axial clearance</b>                 |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Standard axial clearance                                                |                            |                           |    |   |    |   |   |    |    |     |     |
| X                                      | Reduced axial clearance                                                 |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Shield and seal</b>                 |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | No shield and seal                                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| TT <sup>4)</sup>                       | Sealed                                                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| PP <sup>4)</sup>                       | Shielded                                                                |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Lubricant</b>                       |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Grease G354                                                             |                            |                           |    |   |    |   |   |    |    |     |     |
| -2                                     | Grease G395                                                             |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of inner ring</b> |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| CP6 <sup>2)</sup>                      | Chromium plated sphere                                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| CP109 <sup>2)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |                            |                           |    |   |    |   |   |    |    |     |     |
| CP55 <sup>2)</sup>                     | Passivated corrosion-resistant steel inner ring                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Oversize</b>                        |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Standard outer diameter size                                            |                            |                           |    |   |    |   |   |    |    |     |     |
| R10                                    | 0,1 mm oversized outer diameter                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| R20                                    | 0,2 mm oversized outer diameter                                         |                            |                           |    |   |    |   |   |    |    |     |     |

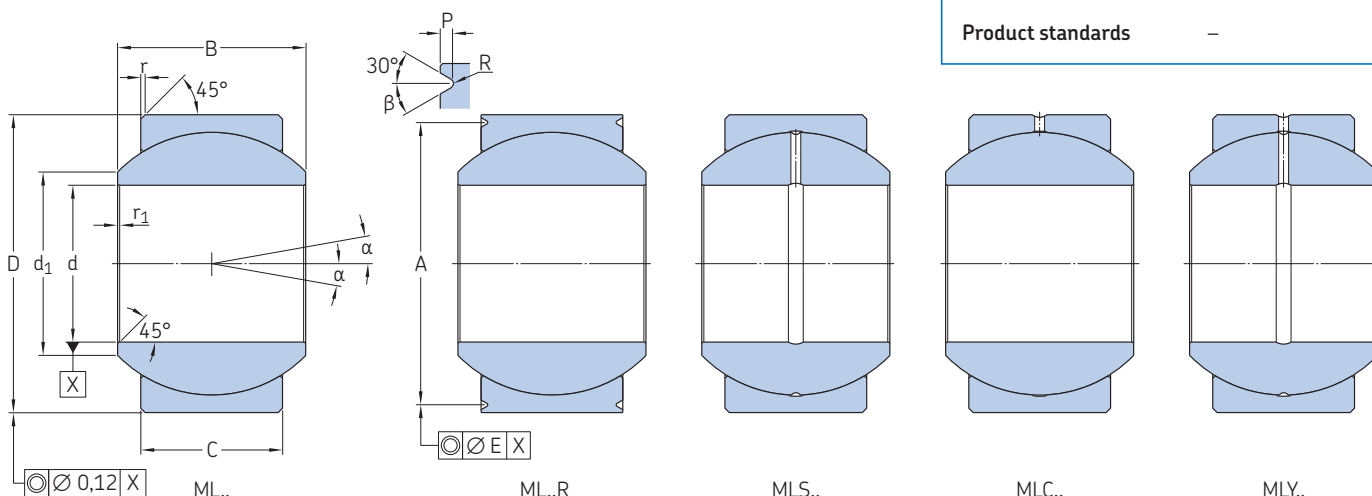
<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 6$

<sup>4)</sup> Only available for  $d \geq 6$

## 2.7 Metal-to-metal swaged wide (metric dimensions)

ML bore code 25 to 60



Technical specification –  
Product standards –

| d    | β  | E    |
|------|----|------|
| mm   | °  | mm   |
| ≤ 6  | 20 | 0,08 |
| = 8  | 30 | 0,08 |
| ≥ 10 | 30 | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d | Δdmp  | D   | ΔDmp  | C ±0,1 | B 0/-0,06 |
|-------------------|--------------|-------|-----|-------|--------|-----------|
| –                 | mm           | μm    | mm  | μm    | mm     |           |
| 25                | 25           | 0/-10 | 54  | 0/-13 | 26     | 32        |
| 30                | 30           | 0/-10 | 60  | 0/-13 | 28     | 34        |
| 35                | 35           | 0/-12 | 65  | 0/-13 | 29     | 36        |
| 40                | 40           | 0/-12 | 68  | 0/-13 | 31     | 38        |
| 45                | 45           | 0/-12 | 76  | 0/-13 | 33     | 41        |
| 50                | 50           | 0/-12 | 82  | 0/-15 | 35     | 44        |
| 55                | 55           | 0/-12 | 96  | 0/-15 | 40     | 52        |
| 60                | 60           | 0/-12 | 105 | 0/-15 | 48     | 60        |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 ≈ | A +0,1/0 | P 0/-0,2 | R +0,1/0 | r       | r1 +0,3/0 | α <sup>3)</sup> | Mass ≈ | Static limit loads <sup>2)</sup> Radial Cs | Axial Ca <sup>1)</sup> | Axial clearance Reduced | Standard |
|-------------------|-----------------|----------|----------|----------|---------|-----------|-----------------|--------|--------------------------------------------|------------------------|-------------------------|----------|
| –                 | mm              |          |          |          |         |           | °               | g      | kN                                         |                        | μm                      |          |
| 25                | 35,3            | 50,8     | 1,4      | 0,3      | 0,6/1   | 0,1       | 9               | 445    | 496,6                                      | 93,2                   | 5/50                    | 50/100   |
| 30                | 40,9            | 56,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 8               | 480    | 587,5                                      | 109,6                  | 5/50                    | 50/100   |
| 35                | 45,5            | 61,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 8               | 565    | 666,0                                      | 117,6                  | 5/50                    | 50/100   |
| 40                | 47              | 64,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 8               | 600    | 745,6                                      | 136,6                  | 5/50                    | 50/100   |
| 45                | 54,1            | 72,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 8               | 800    | 895,9                                      | 155,6                  | 5/60                    | 60/120   |
| 50                | 60,3            | 78,8     | 1,4      | 0,3      | 0,8/1,2 | 0,1       | 8               | 970    | 1 024,7                                    | 176,2                  | 5/60                    | 60/120   |
| 55                | 63,4            | 92,8     | 1,5      | 0,3      | 0,8/1,2 | 0,1       | 10              | 1 580  | 1 298,7                                    | 221,2                  | 5/60                    | 60/120   |
| 60                | 69,7            | 101,8    | 1,5      | 0,3      | 0,8/1,2 | 0,1       | 9               | 2 250  | 1 681,8                                    | 243,7                  | 5/60                    | 60/120   |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140



## Designation system

|                                        |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
|----------------------------------------|-------------------------------------------------------------------------|----------------------------|---------------------------|----|---|----|---|---|----|----|-----|-----|
| Examples:                              | ZWQMLS20RXTT-2CP6R10                                                    | Z                          | WQ                        | ML | S | 20 | R | X | TT | -2 | CP6 | R10 |
|                                        | QMLC30PPCP109                                                           |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of outer ring</b> |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| Z                                      | Cadmium plated external dimensions                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| SZ                                     | Zinc-nickel plated external dimensions                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Material code</b>                   |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Inner ring material</b>             |                                                                         | <b>Outer ring material</b> |                           |    |   |    |   |   |    |    |     |     |
| W                                      | Corrosion-resistant steel                                               |                            | Corrosion-resistant steel |    |   |    |   |   |    |    |     |     |
| Q                                      | Bronze beryllium                                                        |                            | Corrosion-resistant steel |    |   |    |   |   |    |    |     |     |
| WQ                                     | Corrosion-resistant steel                                               |                            | Bronze aluminium          |    |   |    |   |   |    |    |     |     |
| <b>Basic designation</b>               |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Lubrication grooves</b>             |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Without lubrication groove                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| S                                      | Lubrication by inner ring                                               |                            |                           |    |   |    |   |   |    |    |     |     |
| C <sup>3)</sup>                        | Lubrication by outer ring                                               |                            |                           |    |   |    |   |   |    |    |     |     |
| Y                                      | Lubrication by inner and outer ring                                     |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Bore code</b>                       |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Chamfer and groove</b>              |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Chamfered outer ring                                                    |                            |                           |    |   |    |   |   |    |    |     |     |
| R                                      | Grooved outer ring                                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Axial clearance</b>                 |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Standard axial clearance                                                |                            |                           |    |   |    |   |   |    |    |     |     |
| X                                      | Reduced axial clearance                                                 |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Shield and seal</b>                 |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | No shield and seal                                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| TT <sup>4)</sup>                       | Sealed                                                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| PP <sup>4)</sup>                       | Shielded                                                                |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Lubricant</b>                       |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Grease G354                                                             |                            |                           |    |   |    |   |   |    |    |     |     |
| -2                                     | Grease G395                                                             |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of inner ring</b> |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| CP6 <sup>2)</sup>                      | Chromium plated sphere                                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| CP109 <sup>2)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |                            |                           |    |   |    |   |   |    |    |     |     |
| CP55 <sup>2)</sup>                     | Passivated corrosion-resistant steel inner ring                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Oversize</b>                        |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Standard outer diameter size                                            |                            |                           |    |   |    |   |   |    |    |     |     |
| R10                                    | 0,1 mm oversized outer diameter                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| R20                                    | 0,2 mm oversized outer diameter                                         |                            |                           |    |   |    |   |   |    |    |     |     |

<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

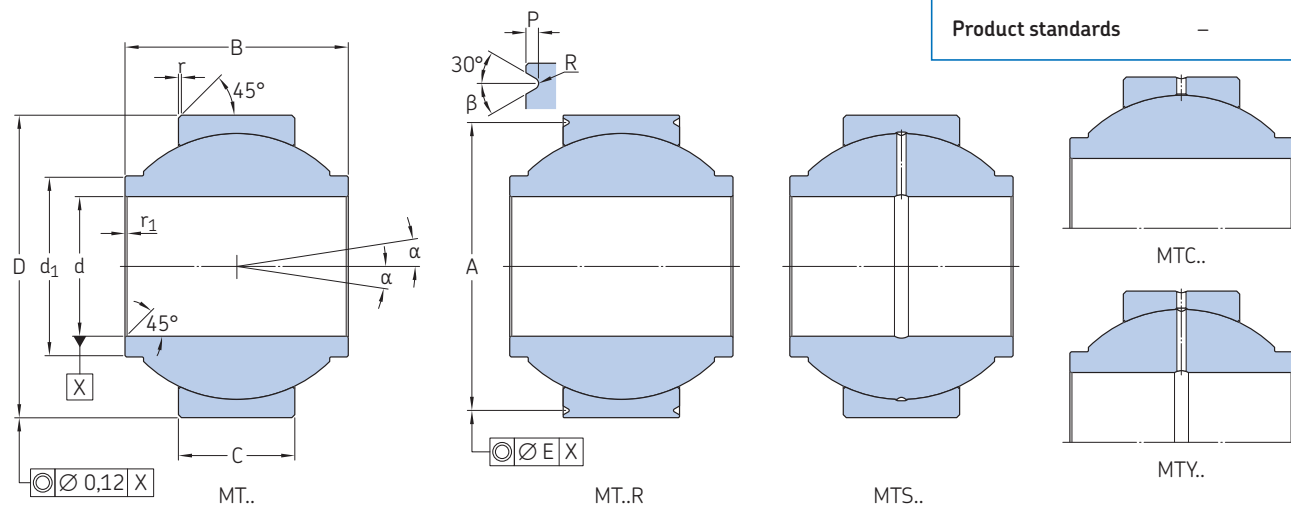
<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 6$

<sup>4)</sup> Only available for  $d \geq 6$

## 2.8 Metal-to-metal swaged high misalignment (metric dimensions)

MT

Technical specification –  
Product standards –



| d   | β  | E    |
|-----|----|------|
| mm  | °  | mm   |
| ≤ 6 | 20 | 0,08 |
| ≥ 8 | 30 | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d | Δdmp  | D  | ΔDmp  | C ±0,1 | B 0/-0,06 |
|-------------------|--------------|-------|----|-------|--------|-----------|
| –                 | mm           | μm    | mm | μm    | mm     |           |
| 5                 | 5            | 0/-8  | 14 | 0/-8  | 5      | 12,5      |
| 6                 | 6            | 0/-8  | 19 | 0/-8  | 6      | 15        |
| 8                 | 8            | 0/-8  | 25 | 0/-9  | 9      | 21        |
| 10                | 10           | 0/-8  | 25 | 0/-9  | 9      | 21        |
| 12                | 12           | 0/-8  | 30 | 0/-9  | 10     | 24        |
| 17                | 17           | 0/-8  | 36 | 0/-11 | 14     | 30        |
| 20                | 20           | 0/-10 | 40 | 0/-11 | 16     | 33        |
| 22                | 22           | 0/-10 | 45 | 0/-11 | 16     | 36        |
| 25                | 25           | 0/-10 | 54 | 0/-13 | 21     | 48        |
| 30                | 30           | 0/-10 | 65 | 0/-13 | 25     | 48        |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d <sub>1</sub> ≈ | A +0.15/0 | P 0/-0,2 | R +0,1/0 | r +0,3/0 | r <sub>1</sub> +0,3/0 | α <sup>3)</sup> | Mass ≈ | Static limit loads <sup>2)</sup> Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>1)</sup> | Axial clearance Reduced | Standard |
|-------------------|-----------------------------|-----------|----------|----------|----------|-----------------------|-----------------|--------|--------------------------------------------------------|------------------------------------|-------------------------|----------|
| –                 | mm                          |           |          |          |          |                       | °               | g      | kN                                                     |                                    | μm                      |          |
| 5                 | 7,8                         | 12,2      | 0,7      | 0,2      | 0,5      | 0,1                   | 15              | 8      | 16,5                                                   | 0,7                                | 5/35                    | 35/75    |
| 6                 | 9,6                         | 17,2      | 0,7      | 0,2      | 0,5      | 0,1                   | 24              | 17     | 30,5                                                   | 1,3                                | 5/35                    | 35/75    |
| 8                 | 13,3                        | 22,4      | 0,9      | 0,3      | 0,5      | 0,1                   | 20              | 39     | 70,4                                                   | 8,4                                | 5/35                    | 35/75    |
| 10                | 13,3                        | 22,4      | 0,9      | 0,3      | 0,5      | 0,1                   | 20              | 34     | 70,4                                                   | 8,4                                | 5/35                    | 35/75    |
| 12                | 17,7                        | 27,4      | 0,9      | 0,3      | 0,5      | 0,1                   | 20              | 65     | 95,8                                                   | 10,3                               | 5/35                    | 35/75    |
| 17                | 21,8                        | 33,4      | 0,9      | 0,3      | 0,5      | 0,1                   | 20              | 110    | 174,6                                                  | 25,8                               | 5/40                    | 40/80    |
| 20                | 24                          | 36,8      | 1,4      | 0,3      | 0,5      | 0,1                   | 19              | 142    | 234,4                                                  | 33,3                               | 5/40                    | 40/80    |
| 22                | 28,3                        | 41,8      | 1,4      | 0,3      | 0,5      | 0,1                   | 19              | 194    | 266,3                                                  | 33,3                               | 5/40                    | 40/80    |
| 25                | 32,2                        | 50,8      | 1,4      | 0,3      | 0,5      | 0,1                   | 21              | 401    | 391,8                                                  | 55,9                               | 5/50                    | 50/100   |
| 30                | 38,8                        | 61,8      | 1,4      | 0,3      | 0,5      | 0,1                   | 21              | 600    | 583,7                                                  | 75,9                               | 5/50                    | 50/100   |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## Designation system

|                                        |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
|----------------------------------------|-------------------------------------------------------------------------|----------------------------|---------------------------|----|---|----|---|---|----|----|-----|-----|
| Examples:                              | ZWQMTS20RXTT-2CP6R10                                                    | Z                          | WQ                        | MT | S | 20 | R | X | TT | -2 | CP6 | R10 |
|                                        | QMT30PPCP109                                                            |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of outer ring</b> |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| Z                                      | Cadmium plated external dimensions                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| SZ                                     | Zinc-nickel plated external dimensions                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Material code</b>                   |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Inner ring material</b>             |                                                                         | <b>Outer ring material</b> |                           |    |   |    |   |   |    |    |     |     |
| W                                      | Corrosion-resistant steel                                               |                            | Corrosion-resistant steel |    |   |    |   |   |    |    |     |     |
| Q                                      | Bronze beryllium                                                        |                            | Corrosion-resistant steel |    |   |    |   |   |    |    |     |     |
| WQ                                     | Corrosion-resistant steel                                               |                            | Bronze aluminium          |    |   |    |   |   |    |    |     |     |
| <b>Basic designation</b>               |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Lubrication grooves</b>             |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Without lubrication groove                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| S                                      | Lubrication by inner ring                                               |                            |                           |    |   |    |   |   |    |    |     |     |
| C <sup>3)</sup>                        | Lubrication by outer ring                                               |                            |                           |    |   |    |   |   |    |    |     |     |
| Y                                      | Lubrication by inner and outer ring                                     |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Bore code</b>                       |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Chamfer and groove</b>              |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Chamfered outer ring                                                    |                            |                           |    |   |    |   |   |    |    |     |     |
| R                                      | Grooved outer ring                                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Axial clearance</b>                 |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Standard axial clearance                                                |                            |                           |    |   |    |   |   |    |    |     |     |
| X                                      | Reduced axial clearance                                                 |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Shield and seal</b>                 |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | No shield and seal                                                      |                            |                           |    |   |    |   |   |    |    |     |     |
| TT <sup>4)</sup>                       | Sealed                                                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| PP <sup>4)</sup>                       | Shielded                                                                |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Lubricant</b>                       |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Grease G354                                                             |                            |                           |    |   |    |   |   |    |    |     |     |
| -2                                     | Grease G395                                                             |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Surface treatment of inner ring</b> |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |    |   |    |   |   |    |    |     |     |
| CP6 <sup>2)</sup>                      | Chromium plated sphere                                                  |                            |                           |    |   |    |   |   |    |    |     |     |
| CP109 <sup>2)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |                            |                           |    |   |    |   |   |    |    |     |     |
| CP55 <sup>2)</sup>                     | Passivated corrosion-resistant steel inner ring                         |                            |                           |    |   |    |   |   |    |    |     |     |
| <b>Oversize</b>                        |                                                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| No code                                | Standard outer diameter size                                            |                            |                           |    |   |    |   |   |    |    |     |     |
| R10                                    | 0,1 mm oversized outer diameter                                         |                            |                           |    |   |    |   |   |    |    |     |     |
| R20                                    | 0,2 mm oversized outer diameter                                         |                            |                           |    |   |    |   |   |    |    |     |     |

<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 6$

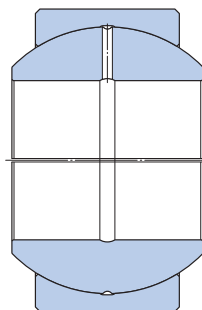
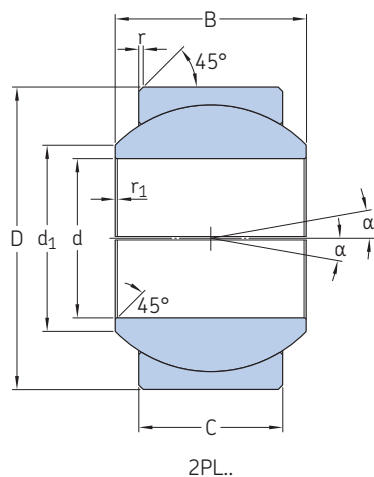
<sup>4)</sup> Only available for  $d \geq 6$

## 2.9 Metal-to-metal split (metric dimensions)

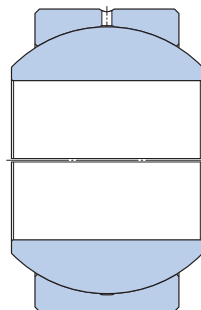
2PL..

Technical specification –

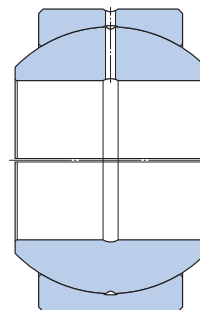
Product standards –



2PLS..



2PLC..



2PLY..

### Dimensions

| Nominal bore code | Dimensions d | $\Delta d_{mp}$ | D   | $\Delta D_{mp}$ | C $\pm 1$ | B 0/-0,06 |
|-------------------|--------------|-----------------|-----|-----------------|-----------|-----------|
| –                 | mm           | $\mu m$         | mm  | $\mu m$         | mm        |           |
| 10                | 10           | 0/-7            | 21  | 0/-8            | 10        | 12,5      |
| 12                | 12           | 0/-8            | 26  | 0/-8            | 13        | 16        |
| 15                | 15           | 0/-8            | 29  | 0/-8            | 13,5      | 17        |
| 17                | 17           | 0/-8            | 30  | 0/-8            | 14,5      | 18        |
| 20                | 20           | 0/-9            | 35  | 0/-9            | 16        | 20        |
| 25                | 25           | 0/-9            | 54  | 0/-11           | 26        | 32        |
| 30                | 30           | 0/-9            | 60  | 0/-11           | 28        | 34        |
| 35                | 35           | 0/-11           | 65  | 0/-11           | 29        | 36        |
| 40                | 40           | 0/-11           | 68  | 0/-11           | 31        | 38        |
| 45                | 45           | 0/-11           | 76  | 0/-11           | 33        | 41        |
| 50                | 50           | 0/-11           | 82  | 0/-13           | 35        | 44        |
| 55                | 55           | 0/-12           | 96  | 0/-13           | 40        | 52        |
| 60                | 60           | 0/-12           | 105 | 0/-13           | 48        | 60        |

### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions d1 $\approx$ | r +0,3/0 | r1 +0,3/0 | $\alpha^{(2)}$ | Mass $\approx$ | Static limit loads <sup>1)</sup> Radial Cs | Axial Ca | Radial clearance |
|-------------------|-------------------------|----------|-----------|----------------|----------------|--------------------------------------------|----------|------------------|
| –                 | mm                      |          |           | °              | g              | kN                                         |          | $\mu m$          |
| 10                | 12,2                    | 0,5      | 0,1       | 10             | 27             | 94,3                                       | 21       | 10/20            |
| 12                | 15,5                    | 0,5      | 0,1       | 10             | 49             | 160                                        | 37,3     | 10/20            |
| 15                | 18,9                    | 0,5      | 0,1       | 9              | 62             | 190,5                                      | 40,5     | 10/30            |
| 17                | 20,1                    | 0,5      | 0,1       | 9              | 69             | 218,5                                      | 47,2     | 10/30            |
| 20                | 23,5                    | 0,5      | 0,1       | 8              | 104            | 278,1                                      | 58,3     | 10/30            |
| 25                | 35,3                    | 0,7      | 0,1       | 9              | 445            | 702,9                                      | 156,8    | 10/30            |
| 30                | 40,9                    | 0,9      | 0,1       | 8              | 480            | 861,2                                      | 188,9    | 10/30            |
| 35                | 45,5                    | 0,9      | 0,1       | 8              | 565            | 974,6                                      | 203,2    | 10/40            |
| 40                | 47                      | 0,9      | 0,1       | 8              | 600            | 1 080,3                                    | 230,2    | 10/40            |
| 45                | 54,1                    | 0,9      | 0,1       | 8              | 800            | 1 286,8                                    | 258,8    | 10/40            |
| 50                | 60,3                    | 0,9      | 0,1       | 8              | 970            | 1 504,2                                    | 292,6    | 10/40            |
| 55                | 63,4                    | 0,9      | 0,1       | 10             | 1 580          | 1 991,8                                    | 386,2    | 10/40            |
| 60                | 69,7                    | 0,9      | 0,1       | 9              | 2 250          | 2 572,3                                    | 562,8    | 10/40            |

<sup>1)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>2)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## Designation system

|                                        |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
|----------------------------------------|-------------------------------------------------------------------------|----------------------------|---------------------------|---|-----|---|----|----|----|-----|-----|
| Examples:                              | ZW2PLS20TT-2CP6R10<br>Q2PLC30PPCP109                                    |                            | Z                         | W | 2PL | S | 20 | TT | -2 | CP6 | R10 |
| <b>Surface treatment of outer ring</b> |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |   |     |   |    |    |    |     |     |
| Z                                      | Cadmium plated external dimensions                                      |                            |                           |   |     |   |    |    |    |     |     |
| SZ                                     | Zinc-nickel plated external dimensions                                  |                            |                           |   |     |   |    |    |    |     |     |
| <b>Material code</b>                   |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| <b>Inner ring material</b>             |                                                                         | <b>Outer ring material</b> |                           |   |     |   |    |    |    |     |     |
| W                                      | Corrosion-resistant steel                                               |                            | Corrosion-resistant steel |   |     |   |    |    |    |     |     |
| Q                                      | Bronze beryllium                                                        |                            | Corrosion-resistant steel |   |     |   |    |    |    |     |     |
| WQ                                     | Corrosion-resistant steel                                               |                            | Bronze aluminium          |   |     |   |    |    |    |     |     |
| <b>Basic designation</b>               |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| <b>Lubrication grooves</b>             |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| No code                                | Without lubrication groove                                              |                            |                           |   |     |   |    |    |    |     |     |
| S                                      | Lubrication by inner ring                                               |                            |                           |   |     |   |    |    |    |     |     |
| C                                      | Lubrication by outer ring                                               |                            |                           |   |     |   |    |    |    |     |     |
| Y                                      | Lubrication by inner and outer ring                                     |                            |                           |   |     |   |    |    |    |     |     |
| <b>Bore code</b>                       |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| <b>Shield and seal</b>                 |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| No code                                | No shield and seal                                                      |                            |                           |   |     |   |    |    |    |     |     |
| TT                                     | Sealed                                                                  |                            |                           |   |     |   |    |    |    |     |     |
| PP                                     | Shielded                                                                |                            |                           |   |     |   |    |    |    |     |     |
| <b>Lubricant</b>                       |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| No code                                | Grease G354                                                             |                            |                           |   |     |   |    |    |    |     |     |
| -2                                     | Grease G395                                                             |                            |                           |   |     |   |    |    |    |     |     |
| <b>Surface treatment of inner ring</b> |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| No code                                | Not plated                                                              |                            |                           |   |     |   |    |    |    |     |     |
| CP6 <sup>1)</sup>                      | Chromium plated                                                         |                            |                           |   |     |   |    |    |    |     |     |
| CP109 <sup>1)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |                            |                           |   |     |   |    |    |    |     |     |
| CP55 <sup>1)</sup>                     | Passivated corrosion-resistant steel inner ring                         |                            |                           |   |     |   |    |    |    |     |     |
| <b>Oversize</b>                        |                                                                         |                            |                           |   |     |   |    |    |    |     |     |
| No code                                | Standard outer diameter size                                            |                            |                           |   |     |   |    |    |    |     |     |
| R10                                    | 0,1 mm oversized outer diameter                                         |                            |                           |   |     |   |    |    |    |     |     |
| R20                                    | 0,2 mm oversized outer diameter                                         |                            |                           |   |     |   |    |    |    |     |     |

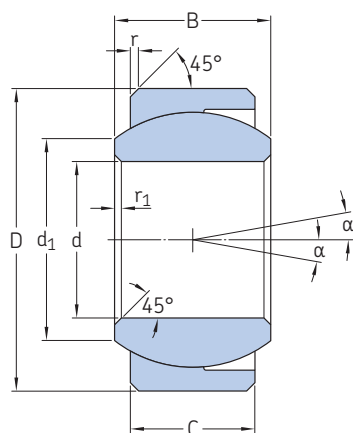
<sup>1)</sup> Available only for inner ring in corrosion-resistant steel material

## 2.10 Metal-to-metal loader slot wide (inch dimensions)

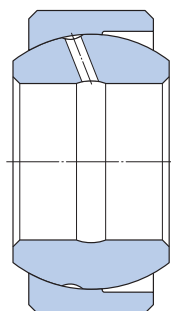
GT..

Technical specification –

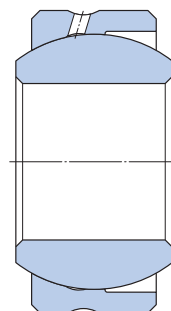
Product standards –



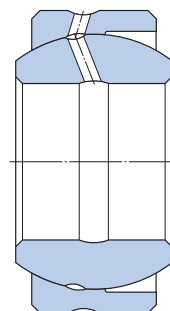
GT..



GTS..



GTC..



GTY..

### Dimensions

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions<br>d<br>0/-0.0005<br>0/-0.0127 | D<br>0/-0.0005<br>0/-0.0127 | C<br>±0.005<br>±0.127 | B<br>0/-0.002<br>0/-0.051 | d <sub>1</sub><br>≈ | r <sub>1</sub><br>±0.005<br>±0.127 | r<br>+0.010/0<br>+0.254/0 | α <sup>1)</sup> |
|-------------------|---------------------------------------|-------------------------------------------|-----------------------------|-----------------------|---------------------------|---------------------|------------------------------------|---------------------------|-----------------|
| –                 |                                       | in/mm                                     |                             |                       |                           |                     |                                    |                           | °               |
| 12,7              | 08                                    | 0.5000<br>12,700                          | 1.0000<br>25,400            | 0.390<br>9,906        | 0.500<br>12,700           | 0.600<br>15,240     | 0.010<br>0,254                     | 0.020<br>0,508            | 8               |
| 14,29             | 09                                    | 0.5625<br>14,288                          | 1.0937<br>27,780            | 0.437<br>11,100       | 0.562<br>14,275           | 0.670<br>17,018     | 0.010<br>0,254                     | 0.020<br>0,508            | 9               |
| 15,87             | 10                                    | 0.6250<br>15,875                          | 1.1875<br>30,163            | 0.500<br>12,700       | 0.625<br>15,875           | 0.739<br>18,771     | 0.010<br>0,254                     | 0.020<br>0,508            | 8               |
| 19,05             | 12                                    | 0.7500<br>19,050                          | 1.4375<br>36,513            | 0.593<br>15,062       | 0.750<br>19,050           | 0.920<br>23,368     | 0.010<br>0,254                     | 0.030<br>0,762            | 8               |
| 22,22             | 14                                    | 0.8750<br>22,225                          | 1.5625<br>39,688            | 0.703<br>17,856       | 0.875<br>22,225           | 0.980<br>24,892     | 0.010<br>0,254                     | 0.030<br>0,762            | 8               |
| 25,4              | 16                                    | 1.0000<br>25,400                          | 1.7500<br>44,450            | 0.797<br>20,244       | 1.000<br>25,400           | 1.118<br>28,397     | 0.010<br>0,254                     | 0.030<br>0,762            | 9               |
| 31,75             | 20                                    | 1.2500<br>31,750                          | 2.0000<br>50,800            | 0.937<br>23,800       | 1.093<br>27,762           | 1.445<br>36,700     | 0.010<br>0,254                     | 0.030<br>0,762            | 6               |
| 38,10             | 24                                    | 1.5000<br>38,100                          | 2.4375<br>61,913            | 1.135<br>28,830       | 1.312<br>33,325           | 1.870<br>47,500     | 0.010<br>0,254                     | 0.030<br>0,762            | 6               |
| 44,45             | 28                                    | 1.7500<br>44,450                          | 2.8750<br>73,025            | 1.000<br>25,400       | 1.125<br>28,575           | 2.252<br>57,200     | 0.010<br>0,254                     | 0.030<br>0,762            | 4               |

<sup>1)</sup> Values are given for non protected bearings. For sealed bearings, refer to page 140



## Designation system

|                                                |                                                                         |   |   |    |   |      |   |    |     |      |
|------------------------------------------------|-------------------------------------------------------------------------|---|---|----|---|------|---|----|-----|------|
| Examples:                                      | ZWGT512,7E-2CP6RP01<br>QGTCT24,4EECP109                                 | Z | W | GT | S | 12,7 | E | -2 | CP6 | RP01 |
| <b>Surface treatment of outer ring</b>         |                                                                         |   |   |    |   |      |   |    |     |      |
| No code                                        | Not plated                                                              |   |   |    |   |      |   |    |     |      |
| Z                                              | Cadmium plated external dimensions                                      |   |   |    |   |      |   |    |     |      |
| SZ                                             | Zinc-nickel plated external dimensions                                  |   |   |    |   |      |   |    |     |      |
| <b>Material</b>                                |                                                                         |   |   |    |   |      |   |    |     |      |
| No code                                        | Bearing steel inner ring and outer ring                                 |   |   |    |   |      |   |    |     |      |
| W                                              | Corrosion-resistant steel inner ring and outer ring                     |   |   |    |   |      |   |    |     |      |
| Q                                              | Bronze beryllium inner ring and bearing steel outer ring                |   |   |    |   |      |   |    |     |      |
| <b>Basic designation</b>                       |                                                                         |   |   |    |   |      |   |    |     |      |
| <b>Lubrication grooves and axial clearance</b> |                                                                         |   |   |    |   |      |   |    |     |      |
| No code                                        | Without lubrication groove and reduced axial clearance                  |   |   |    |   |      |   |    |     |      |
| S                                              | Lubrication by inner ring and standard axial clearance                  |   |   |    |   |      |   |    |     |      |
| C                                              | Lubrication by outer ring and standard axial clearance                  |   |   |    |   |      |   |    |     |      |
| Y                                              | Lubrication by inner and outer ring and standard axial clearance        |   |   |    |   |      |   |    |     |      |
| <b>Bore code</b>                               |                                                                         |   |   |    |   |      |   |    |     |      |
| <b>Seal</b>                                    |                                                                         |   |   |    |   |      |   |    |     |      |
| No code                                        | No seal                                                                 |   |   |    |   |      |   |    |     |      |
| E                                              | Sealed on the slot side                                                 |   |   |    |   |      |   |    |     |      |
| EE                                             | Sealed on both sides                                                    |   |   |    |   |      |   |    |     |      |
| <b>Lubricant</b>                               |                                                                         |   |   |    |   |      |   |    |     |      |
| No code                                        | Grease G354                                                             |   |   |    |   |      |   |    |     |      |
| -2                                             | Grease G395                                                             |   |   |    |   |      |   |    |     |      |
| <b>Surface treatment of inner ring</b>         |                                                                         |   |   |    |   |      |   |    |     |      |
| No code                                        | Not plated                                                              |   |   |    |   |      |   |    |     |      |
| CP6 <sup>1)</sup>                              | Chromium plated sphere                                                  |   |   |    |   |      |   |    |     |      |
| CP109 <sup>1)</sup>                            | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |    |   |      |   |    |     |      |
| CP55 <sup>1)</sup>                             | Passivated corrosion-resistant steel inner ring                         |   |   |    |   |      |   |    |     |      |
| <b>Oversize</b>                                |                                                                         |   |   |    |   |      |   |    |     |      |
| No code                                        | Standard outer diameter size                                            |   |   |    |   |      |   |    |     |      |
| RP01                                           | 0.010 in/0,254 mm oversized outer diameter                              |   |   |    |   |      |   |    |     |      |
| RP02                                           | 0.020 in/0,508 mm oversized outer diameter                              |   |   |    |   |      |   |    |     |      |

<sup>1)</sup> Available only for inner ring in corrosion-resistant steel material

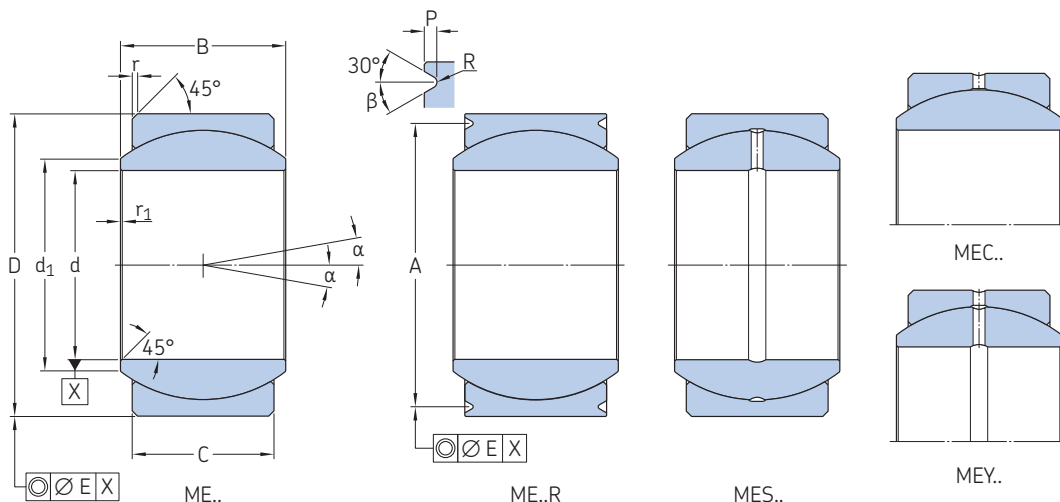
## Loads and clearance

| Nominal bore code | Dash number multiples of 1/16 inch | Mass ≈        | Static limit loads <sup>2)</sup> |                      | Axial clearance        |                        |
|-------------------|------------------------------------|---------------|----------------------------------|----------------------|------------------------|------------------------|
|                   |                                    |               | Radial C <sub>s</sub>            | Axial C <sub>a</sub> | Standard GT            | Reduced GTS GTC GTY    |
| –                 |                                    | lb/g          | lbf/kN                           |                      | in/μm                  |                        |
| 12,7              | 08                                 | 0.07<br>30    | 20 520<br>91,7                   | 1 395<br>6,2         | 0.0002/0.0010<br>5/25  | 0.0006/0.0015<br>15/38 |
| 14,29             | 09                                 | 0.09<br>39    | 26 460<br>117,7                  | 1 800<br>8,0         | 0.0002/0.0010<br>5/25  | 0.0006/0.0015<br>15/38 |
| 15,87             | 10                                 | 0.11<br>52    | 32 940<br>146,5                  | 2 452<br>10,9        | 0.0002/0.0010<br>5/25  | 0.0006/0.0015<br>15/38 |
| 19,05             | 12                                 | 0.20<br>92    | 47 655<br>212,0                  | 3 465<br>15,4        | 0.0004/0.0012<br>10/32 | 0.0007/0.0018<br>19/45 |
| 22,22             | 14                                 | 0.26<br>0,117 | 62 640<br>278,6                  | 4 972<br>22,1        | 0.0004/0.0012<br>10/32 | 0.0007/0.0018<br>19/45 |
| 25,4              | 16                                 | 0.37<br>170   | 89 550<br>398,4                  | 7 178<br>31,9        | 0.0004/0.0012<br>10/32 | 0.0007/0.0018<br>19/45 |
| 31,75             | 20                                 | 0.51<br>230   | 126 517<br>562,8                 | 10 102<br>44,9       | 0.0006/0.0015<br>10/32 | 0.0010/0.0020<br>25/51 |
| 38,10             | 24                                 | 0.86<br>0,390 | 188 437<br>838,2                 | 16 132<br>71,8       | 0.0006/0.0015<br>10/32 | 0.0010/0.0020<br>25/51 |
| 44,45             | 28                                 | 1.17<br>530   | 202 500<br>900,8                 | 12 532<br>55,7       | 0.0006/0.0015<br>10/32 | 0.0010/0.0020<br>25/51 |

<sup>2)</sup> Loads are given in the opposite direction to the slots and are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

## 2.11 Metal-to-metal swaged narrow (inch dimensions)

ME.. bore code 4,83 to 14,29



|                         |                                            |
|-------------------------|--------------------------------------------|
| Technical specification | AS 8976                                    |
| Product standards       | AS 21154 (grooved)<br>AS 21155 (chamfered) |

| d                             | β  | E              |
|-------------------------------|----|----------------|
| in/mm                         | °  | in/mm          |
| 0.1900/0.3125<br>4,826/7,938  | 20 | 0.003<br>0,076 |
| 0.3750/1.7500<br>9,525/44,450 | 30 | 0.005<br>0,127 |

### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d           | D                      | C                | B                    | d <sub>1</sub>  | r <sub>1</sub>   | r                    | A                    | P                    |
|-------------------|------------------------------------|------------------------|------------------------|------------------|----------------------|-----------------|------------------|----------------------|----------------------|----------------------|
|                   |                                    | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | ±0.005<br>±0,127 | 0/-0.002<br>0/-0,051 | ≈               | ±0.005<br>±0,127 | +0.010/0<br>+0,254/0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |
| in/mm             |                                    |                        |                        |                  |                      |                 |                  |                      |                      |                      |
| 4,83              | 03                                 | 0.1900<br>4,826        | 0.5625<br>14,288       | 0.218<br>5,537   | 0.281<br>7,137       | 0.293<br>7,442  | 0.010<br>0,254   | 0.010<br>0,254       | 0.502<br>12,751      | 0.030<br>0,762       |
| 6,35              | 04                                 | 0.2500<br>6,350        | 0.6562<br>16,667       | 0.250<br>6,350   | 0.343<br>8,712       | 0.364<br>9,246  | 0.010<br>0,254   | 0.010<br>0,254       | 0.596<br>15,140      | 0.030<br>0,762       |
| 7,94              | 05                                 | 0.3125<br>7,938        | 0.7500<br>19,050       | 0.281<br>7,137   | 0.375<br>9,525       | 0.419<br>10,643 | 0.010<br>0,254   | 0.010<br>0,254       | 0.662<br>16,815      | 0.040<br>1,016       |
| 9,52              | 06                                 | 0.3750<br>9,525        | 0.8125<br>20,638       | 0.312<br>7,925   | 0.406<br>10,312      | 0.475<br>12,065 | 0.010<br>0,254   | 0.020<br>0,508       | 0.714<br>18,136      | 0.040<br>1,016       |
| 11,11             | 07                                 | 0.4375<br>11,113       | 0.9062<br>23,017       | 0.343<br>8,712   | 0.437<br>11,100      | 0.530<br>13,462 | 0.010<br>0,254   | 0.020<br>0,508       | 0.808<br>20,523      | 0.040<br>1,016       |
| 12,7              | 08                                 | 0.5000<br>12,700       | 1.0000<br>25,400       | 0.390<br>9,906   | 0.500<br>12,700      | 0.600<br>15,240 | 0.010<br>0,254   | 0.020<br>0,508       | 0.878<br>22,301      | 0.060<br>1,524       |
| 14,29             | 09                                 | 0.5625<br>14,288       | 1.0937<br>27,780       | 0.437<br>11,100  | 0.562<br>14,275      | 0.670<br>17,018 | 0.010<br>0,254   | 0.020<br>0,508       | 0.972<br>24,689      | 0.060<br>1,524       |

### Dimensions cont., loads and clearance

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions R               | α <sup>4)</sup> | Mass ≈     | Static limit loads <sup>3)</sup> | Radial clearance                   | Axial clearance          | Max          | Standard                | Reduced               |
|-------------------|------------------------------------|----------------------------|-----------------|------------|----------------------------------|------------------------------------|--------------------------|--------------|-------------------------|-----------------------|
|                   |                                    |                            |                 |            | Radial C <sub>s</sub>            | Axial C <sub>a</sub> <sup>1)</sup> |                          |              |                         |                       |
|                   |                                    | in/mm                      | °               | lb/g       | lbf/kN                           |                                    |                          |              |                         |                       |
| 4,83              | 03                                 | 0.005/0.010<br>0.127/0.254 | 10              | 0.02<br>9  | 6 300<br>28                      | 2 475<br>11                        | 0.0005/0.0020<br>12,7/50 | 0.010<br>254 | 0.0020/0.0040<br>50/100 | 0.0002/0.0020<br>5/50 |
| 6,35              | 04                                 | 0.005/0.010<br>0.127/0.254 | 13              | 0.02<br>9  | 9 450<br>42                      | 3 600<br>16                        | 0.0005/0.0020<br>12,7/50 | 0.010<br>254 | 0.0020/0.0040<br>50/100 | 0.0002/0.0020<br>5/50 |
| 7,94              | 05                                 | 0.005/0.010<br>0.127/0.254 | 10              | 0.03<br>14 | 12 825<br>57                     | 5 175<br>23                        | 0.0005/0.0020<br>12,7/50 | 0.010<br>254 | 0.0020/0.0040<br>50/100 | 0.0002/0.0020<br>5/50 |
| 9,52              | 06                                 | 0.010/0.020<br>0.254/0.508 | 9               | 0.04<br>18 | 15 750<br>70                     | 5 625<br>25                        | 0.0005/0.0020<br>12,7/50 | 0.010<br>254 | 0.0020/0.0040<br>50/100 | 0.0002/0.0020<br>5/50 |
| 11,11             | 07                                 | 0.010/0.020<br>0.254/0.508 | 8               | 0.05<br>22 | 19 125<br>85                     | 7 650<br>34                        | 0.0005/0.0020<br>12,7/50 | 0.010<br>254 | 0.0020/0.0040<br>50/100 | 0.0002/0.0020<br>5/50 |
| 12,7              | 08                                 | 0.010/0.020<br>0.254/0.508 | 8               | 0.07<br>31 | 24 750<br>110                    | 8 775<br>39                        | 0.0005/0.0020<br>12,7/50 | 0.010<br>254 | 0.0020/0.0040<br>50/100 | 0.0002/0.0020<br>5/50 |
| 14,29             | 09                                 | 0.010/0.020<br>0.254/0.508 | 9               | 0.09<br>40 | 32 400<br>144                    | 10 575<br>47                       | 0.0005/0.0020<br>12,7/50 | 0.010<br>254 | 0.0020/0.0040<br>50/100 | 0.0002/0.0020<br>5/50 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>3)</sup> Loads are valid for the steel/steel spherical plain bearings. For other bearings, refer to page 134

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140



## Designation system

Examples: ZWQMES12,7RXTT-2CP6RP01 Z WQ ME S 12,7 R X TT -2 CP6 RP01  
 QME25,4PPCP109

### Surface treatment of outer ring

**No code<sup>1)</sup>** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

**Material code** **Inner ring material** **External ring material**  
**W** Corrosion-resistant steel Corrosion-resistant steel  
**Q<sup>1)</sup>** Bronze beryllium Corrosion-resistant steel  
**WQ** Corrosion-resistant steel Bronze aluminium

### Basic designation

### Lubrication grooves

**No code<sup>1)</sup>** Without lubrication groove  
**S<sup>1)</sup>** Lubrication by inner ring  
**C<sup>1) 3)</sup>** Lubrication by outer ring  
**Y** Lubrication by inner and outer ring

### Bore code

### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

### Axial clearance

**No code** Standard axial clearance  
**X<sup>1)</sup>** Reduced axial clearance

### Shield and seal

**No code** No shield and seal  
**TT<sup>1) 4)</sup>** Sealed  
**PP<sup>1) 4)</sup>** Shielded

### Lubricant

**No code<sup>1)</sup>** Grease G354  
**-2<sup>1)</sup>** Grease G395  
**-4** Grease G353

### Surface treatment of inner ring

**No code<sup>1)</sup>** Not plated  
**CP6<sup>5)</sup>** Chromium plated sphere  
**CP109<sup>2)</sup>** XCR plating on sphere (chromium 6 free replacement to chromium plating)  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel inner ring

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

1) SKF option

2) SKF option, available only for inner ring in corrosion-resistant steel material

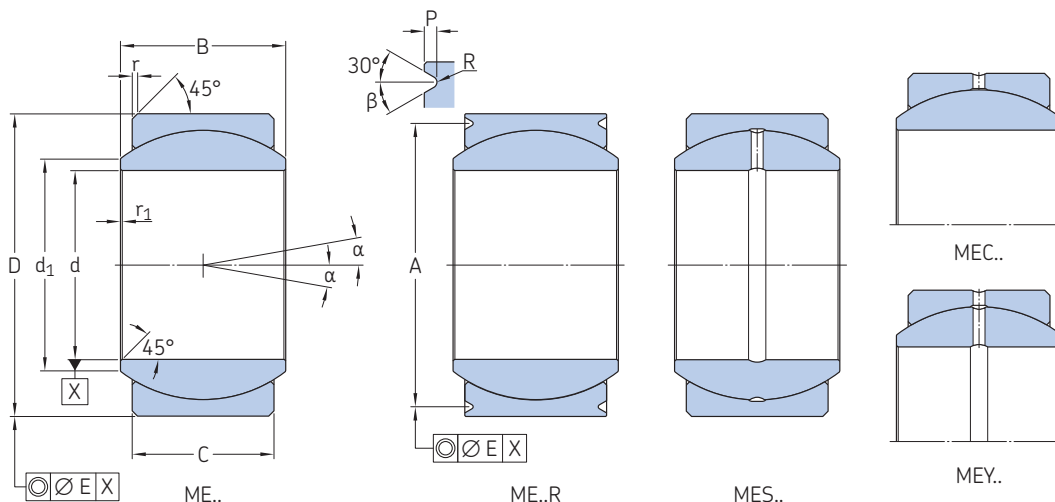
3) In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

4) Only available for  $d \geq 7,94$

5) Available only for inner ring in corrosion-resistant steel material

## 2.11 Metal-to-metal swaged narrow (inch dimensions)

ME.. bore code 15,87 to 44,4



|                         |                                            |
|-------------------------|--------------------------------------------|
| Technical specification | AS 8976                                    |
| Product standards       | AS 21154 (grooved)<br>AS 21155 (chamfered) |

| d                             | β  | E              |
|-------------------------------|----|----------------|
| in/mm                         | °  | in/mm          |
| 0.1900/0.3125<br>4,826/7,938  | 20 | 0.003<br>0,076 |
| 0.3750/1.7500<br>9,525/44,450 | 30 | 0.005<br>0,127 |

### Dimensions

| Nominal bore code   | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d        | D                      | C                | B                    | d <sub>1</sub>  | r <sub>1</sub>   | r                    | A                    | P                    |
|---------------------|------------------------------------------|------------------------|------------------------|------------------|----------------------|-----------------|------------------|----------------------|----------------------|----------------------|
|                     |                                          | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | ±0.005<br>±0,127 | 0/-0.002<br>0/-0,051 | ≈               | ±0.005<br>±0,127 | 0/-0.010<br>0/-0,254 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |
| in/mm               |                                          |                        |                        |                  |                      |                 |                  |                      |                      |                      |
| 15,87               | 10                                       | 0.6250<br>15,875       | 1.1875<br>30,163       | 0.500<br>12,700  | 0.625<br>15,875      | 0.739<br>18,771 | 0.010<br>0,254   | 0.020<br>0,508       | 1.065<br>27,051      | 0.060<br>1,524       |
| 19,05               | 12                                       | 0.7500<br>19,050       | 1.4375<br>36,513       | 0.593<br>15,062  | 0.750<br>19,050      | 0.920<br>23,368 | 0.010<br>0,254   | 0.030<br>0,762       | 1.315<br>33,401      | 0.060<br>1,524       |
| 22,22               | 14                                       | 0.8750<br>22,225       | 1.5625<br>39,688       | 0.703<br>17,856  | 0.875<br>22,225      | 0.980<br>24,892 | 0.010<br>0,254   | 0.030<br>0,762       | 1.440<br>36,576      | 0.060<br>1,524       |
| 25,4                | 16                                       | 1.0000<br>25,400       | 1.7500<br>44,450       | 0.797<br>20,244  | 1.000<br>25,400      | 1.118<br>28,397 | 0.010<br>0,254   | 0.030<br>0,762       | 1.628<br>41,351      | 0.060<br>1,524       |
| 31,75 <sup>2)</sup> | 20                                       | 1.2500<br>31,750       | 2.0000<br>50,800       | 0.937<br>23,800  | 1.093<br>27,762      | 1.445<br>36,700 | 0.010<br>0,254   | 0.030<br>0,762       | 1.878<br>47,701      | 0.060<br>1,524       |
| 38,10 <sup>2)</sup> | 24                                       | 1.5000<br>38,100       | 2.4375<br>61,913       | 1.135<br>28,830  | 1.312<br>33,325      | 1.870<br>47,500 | 0.010<br>0,254   | 0.030<br>0,762       | 2.317<br>58,850      | 0.060<br>1,524       |
| 44,4 <sup>2)</sup>  | 28                                       | 1.7500<br>44,450       | 2.8750<br>73,025       | 1.000<br>25,400  | 1.125<br>28,575      | 2.252<br>57,200 | 0.010<br>0,254   | 0.030<br>0,762       | 2.753<br>69,930      | 0.060<br>1,524       |

### Dimensions cont., loads and clearance

| Nominal bore code   | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>R            | α <sup>4)</sup> | Mass<br>≈   | Static limit load <sup>3)</sup><br>Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>1)</sup> | Radial clearance<br>For products per AS standard | Axial clearance<br>Max<br>Standard<br>For other products | Reduced               |
|---------------------|------------------------------------------|----------------------------|-----------------|-------------|-------------------------------------------------------------|---------------------------------------|--------------------------------------------------|----------------------------------------------------------|-----------------------|
|                     |                                          | in/mm                      | °               | lb/g        | lbf/kN                                                      |                                       | in/μm                                            |                                                          |                       |
| 15,87               | 10                                       | 0.010/0.020<br>0.254/0.508 | 8               | 0.12<br>54  | 41 175<br>183                                               | 14 175<br>63                          | 0.0005/0.0020<br>12,7/50                         | 0.010<br>254                                             | 0.0002/0.0020<br>5/50 |
| 19,05               | 12                                       | 0.010/0.020<br>0.254/0.508 | 8               | 0.21<br>95  | 59 850<br>266                                               | 19 125<br>85                          | 0.0005/0.0020<br>12,7/50                         | 0.010<br>254                                             | 0.0002/0.0020<br>5/50 |
| 22,22               | 14                                       | 0.010/0.020<br>0.254/0.508 | 8               | 0.27<br>122 | 78 750<br>350                                               | 27 900<br>124                         | 0.0005/0.0020<br>12,7/50                         | 0.010<br>254                                             | 0.0002/0.0024<br>5/60 |
| 25,4                | 16                                       | 0.010/0.020<br>0.254/0.508 | 9               | 0.39<br>176 | 101 700<br>452                                              | 35 550<br>158                         | 0.0005/0.0020<br>12,7/50                         | 0.010<br>254                                             | 0.0002/0.0024<br>5/60 |
| 31,75 <sup>2)</sup> | 20                                       | 0.010/0.020<br>0.254/0.508 | 6               | 0.53<br>240 | 142 875<br>636                                              | 52 875<br>235                         | 0.0005/0.0020<br>12,7/50                         | 0.010<br>254                                             | 0.0002/0.0024<br>5/60 |
| 38,10 <sup>2)</sup> | 24                                       | 0.010/0.020<br>0.254/0.508 | 6               | 0.89<br>405 | 216 675<br>964                                              | 81 675<br>363                         | 0.0005/0.0020<br>12,7/50                         | 0.010<br>254                                             | 0.0002/0.0024<br>5/60 |
| 44,45 <sup>2)</sup> | 28                                       | 0.010/0.020<br>0.254/0.508 | 4               | 1.20<br>545 | 216 675<br>964                                              | 50 829<br>226                         | 0.0005/0.0020<br>12,7/50                         | 0.010<br>254                                             | 0.0002/0.0024<br>5/60 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> SKF option

<sup>3)</sup> Loads are valid for the steel/steel spherical plain bearings. For other bearings, refer to page 134

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140



## Designation system

Examples: ZWQMES12,7RXTT-2CP6RP01 Z WQ ME S 12,7 R X TT -2 CP6 RP01  
QME25,4PPCP109

### Surface treatment of outer ring

**No code<sup>1)</sup>** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

**Material code** **Inner ring material** **External ring material**  
**W** Corrosion-resistant steel Corrosion-resistant steel  
**Q<sup>1)</sup>** Bronze beryllium Corrosion-resistant steel  
**WQ** Corrosion-resistant steel Bronze aluminium

### Basic designation

### Lubrication grooves

**No code<sup>1)</sup>** Without lubrication groove  
**S<sup>1)</sup>** Lubrication by inner ring  
**C<sup>1) 3)</sup>** Lubrication by outer ring  
**Y** Lubrication by inner and outer ring

### Bore code

### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

### Axial clearance

**No code** Standard axial clearance  
**X<sup>1)</sup>** Reduced axial clearance

### Shield and seal

**No code** No shield and seal  
**TT<sup>1) 4)</sup>** Sealed  
**PP<sup>1) 4)</sup>** Shielded

### Lubricant

**No code<sup>1)</sup>** Grease G354  
**-2<sup>1)</sup>** Grease G395  
**-4** Grease G353

### Surface treatment of inner ring

**No code<sup>1)</sup>** Not plated  
**CP6<sup>5)</sup>** Chromium plated sphere  
**CP109<sup>2)</sup>** XCR plating on sphere (chromium 6 free replacement to chromium plating)  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel inner ring

### Oversize

**No code** Standard outer diameter size  
**RP01<sup>1)</sup>** 0.010 in/0,254 mm oversized outer diameter  
**RP02<sup>1)</sup>** 0.020 in/0,508 mm oversized outer diameter

1) SKF option

2) SKF option, available only for inner ring in corrosion-resistant steel material

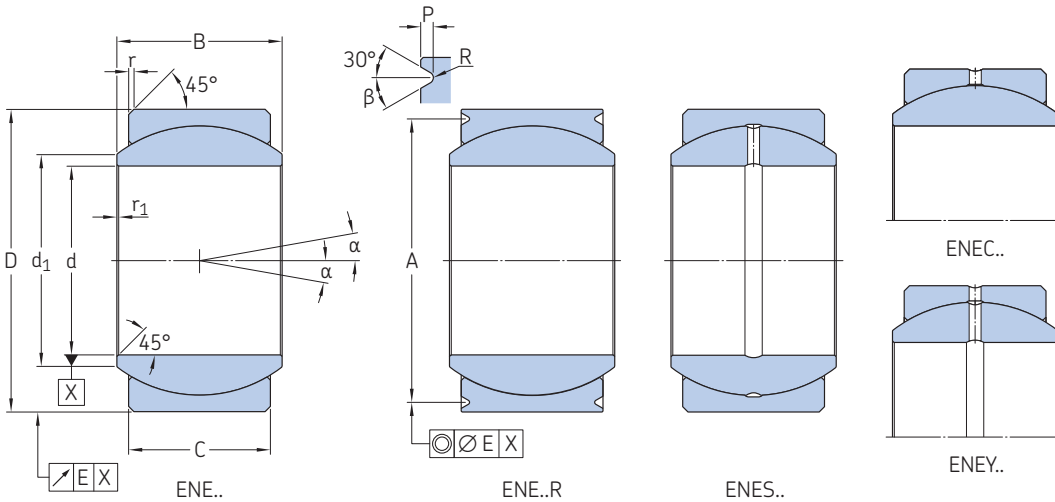
3) In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

4) Only available for  $d \geq 7,94$

5) Available only for inner ring in corrosion-resistant steel material

## 2.12 Metal-to-metal swaged narrow (inch dimensions)

ENE.. bore code **4,83** to **15,87**



|                                |                                                     |
|--------------------------------|-----------------------------------------------------|
| <b>Technical specification</b> | EN 2337                                             |
| <b>Product standards</b>       | EN 6046                                             |
| <b>Materials</b>               | Corrosion-resistant steel inner ring and outer ring |

| d                             | β  | E              |
|-------------------------------|----|----------------|
| in/mm                         | °  | in/mm          |
| 0.1900/0.3125<br>4,826/7,938  | 20 | 0.003<br>0,076 |
| 0.3750/1.7500<br>9,525/44,450 | 30 | 0.005<br>0,127 |

### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d     | Δdmp                   | Δds                    | D                | ΔDmp                  | ΔDs                    | C +0.005/0 +0,127/0 | B 0/-0.002 0/-0,051 |
|-------------------|------------------------------------|------------------|------------------------|------------------------|------------------|-----------------------|------------------------|---------------------|---------------------|
| in/mm             |                                    |                  |                        |                        |                  |                       |                        |                     |                     |
| <b>4,83</b>       | <b>03</b>                          | 0.1900<br>4,826  | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 0.5625<br>14,288 | 0/-0.0003<br>0/-0,008 | 0/-0.0005<br>0/-0,0127 | 0.218<br>5,537      | 0.281<br>7,137      |
| <b>6,35</b>       | <b>04</b>                          | 0.2500<br>6,350  | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 0.6562<br>16,667 | 0/-0.0003<br>0/-0,008 | 0/-0.0005<br>0/-0,0127 | 0.250<br>6,350      | 0.343<br>8,712      |
| <b>7,94</b>       | <b>05</b>                          | 0.3125<br>7,938  | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 0.7500<br>19,050 | 0/-0.0003<br>0/-0,008 | 0/-0.0005<br>0/-0,0127 | 0.281<br>7,137      | 0.375<br>9,525      |
| <b>9,52</b>       | <b>06</b>                          | 0.3750<br>9,525  | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 0.8125<br>20,638 | 0/-0.0004<br>0/-0,009 | 0/-0.0005<br>0/-0,0127 | 0.312<br>7,925      | 0.406<br>10,312     |
| <b>11,11</b>      | <b>07</b>                          | 0.4375<br>11,113 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 0.9062<br>23,017 | 0/-0.0004<br>0/-0,009 | 0/-0.0005<br>0/-0,0127 | 0.343<br>8,712      | 0.437<br>11,100     |
| <b>12,7</b>       | <b>08</b>                          | 0.5000<br>12,700 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 1.0000<br>25,400 | 0/-0.0004<br>0/-0,009 | 0/-0.0005<br>0/-0,0127 | 0.390<br>9,906      | 0.500<br>12,700     |
| <b>14,29</b>      | <b>09</b>                          | 0.5625<br>14,288 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 1.0937<br>27,780 | 0/-0.0004<br>0/-0,009 | 0/-0.0005<br>0/-0,0127 | 0.437<br>11,100     | 0.562<br>14,275     |
| <b>15,87</b>      | <b>10</b>                          | 0.6250<br>15,875 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 1.1875<br>30,163 | 0/-0.0004<br>0/-0,009 | 0/-0.0005<br>0/-0,0127 | 0.500<br>12,700     | 0.625<br>15,875     |

### Dimensions cont.

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d1   | r1 ±0.005 ±0,127 | r 0/-0.010 0/-0,254 | A 0/-0.008 0/-0,203 | P 0/-0.010 0/-0,254 | R                          | α <sup>(6)</sup> | Mass ≈     |
|-------------------|------------------------------------|-----------------|------------------|---------------------|---------------------|---------------------|----------------------------|------------------|------------|
| in/mm             |                                    |                 |                  |                     |                     |                     |                            |                  | lb/g       |
| <b>4,83</b>       | <b>03</b>                          | 0.293<br>7,442  | 0.010<br>0,254   | 0.025<br>0,635      | 0.500<br>12,700     | 0.025<br>0,640      | 0.005/0.010<br>0,127/0,254 | 10               | 0.02<br>7  |
| <b>6,35</b>       | <b>04</b>                          | 0.364<br>9,246  | 0.010<br>0,254   | 0.025<br>0,635      | 0.594<br>15,088     | 0.025<br>0,640      | 0.005/0.010<br>0,127/0,254 | 13               | 0.02<br>11 |
| <b>7,94</b>       | <b>05</b>                          | 0.419<br>10,643 | 0.010<br>0,254   | 0.025<br>0,635      | 0.660<br>16,764     | 0.035<br>0,890      | 0.005/0.010<br>0,127/0,254 | 11               | 0.03<br>14 |
| <b>9,52</b>       | <b>06</b>                          | 0.475<br>12,065 | 0.010<br>0,254   | 0.030<br>0,762      | 0.712<br>18,085     | 0.035<br>0,890      | 0.010/0.017<br>0,254/0,432 | 9                | 0.04<br>18 |
| <b>11,11</b>      | <b>07</b>                          | 0.530<br>13,462 | 0.010<br>0,254   | 0.030<br>0,762      | 0.808<br>20,523     | 0.035<br>0,890      | 0.010/0.017<br>0,254/0,432 | 9                | 0.05<br>23 |
| <b>12,7</b>       | <b>08</b>                          | 0.600<br>15,24  | 0.010<br>0,254   | 0.030<br>0,762      | 0.876<br>22,250     | 0.055<br>1,400      | 0.010/0.017<br>0,254/0,432 | 9                | 0.07<br>32 |
| <b>14,29</b>      | <b>09</b>                          | 0.670<br>17,018 | 0.010<br>0,254   | 0.030<br>0,762      | 0.970<br>24,638     | 0.055<br>1,400      | 0.010/0.017<br>0,254/0,432 | 10               | 0.09<br>41 |
| <b>15,87</b>      | <b>10</b>                          | 0.739<br>18,771 | 0.010<br>0,254   | 0.030<br>0,762      | 1.063<br>27,000     | 0.055<br>1,400      | 0.010/0.017<br>0,254/0,432 | 9                | 0.12<br>54 |



## Designation system

|                                        |                                                                         |   |     |   |      |   |   |    |    |     |      |
|----------------------------------------|-------------------------------------------------------------------------|---|-----|---|------|---|---|----|----|-----|------|
| Examples:                              | ZENES12,7RXTT-2CP6RP01                                                  | Z | ENE | S | 12,7 | R | X | TT | -2 | CP6 | RP01 |
|                                        | ENEC25,4PPCP109                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Surface treatment of outer ring</b> |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Not plated                                                              |   |     |   |      |   |   |    |    |     |      |
| Z                                      | Cadmium plated external dimensions                                      |   |     |   |      |   |   |    |    |     |      |
| SZ <sup>1)</sup>                       | Zinc-nickel plated external dimensions                                  |   |     |   |      |   |   |    |    |     |      |
| <b>Basic designation</b>               |                                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Lubrication grooves</b>             |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Without lubrication groove                                              |   |     |   |      |   |   |    |    |     |      |
| S                                      | Lubrication by inner ring                                               |   |     |   |      |   |   |    |    |     |      |
| C <sup>2)</sup>                        | Lubrication by outer ring                                               |   |     |   |      |   |   |    |    |     |      |
| Y <sup>1)</sup>                        | Lubrication by inner and outer ring                                     |   |     |   |      |   |   |    |    |     |      |
| <b>Bore code</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Chamfer and groove</b>              |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Chamfered outer ring                                                    |   |     |   |      |   |   |    |    |     |      |
| R                                      | Grooved outer ring                                                      |   |     |   |      |   |   |    |    |     |      |
| <b>Clearances</b>                      |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Standard clearances                                                     |   |     |   |      |   |   |    |    |     |      |
| X                                      | Reduced clearances                                                      |   |     |   |      |   |   |    |    |     |      |
| <b>Shield and seal</b>                 |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | No shield and seal                                                      |   |     |   |      |   |   |    |    |     |      |
| TT <sup>1) 3)</sup>                    | Sealed                                                                  |   |     |   |      |   |   |    |    |     |      |
| PP <sup>1) 3)</sup>                    | shielded                                                                |   |     |   |      |   |   |    |    |     |      |
| <b>Lubricant</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Grease G354                                                             |   |     |   |      |   |   |    |    |     |      |
| -2                                     | Grease G395                                                             |   |     |   |      |   |   |    |    |     |      |
| <b>Surface treatment of inner ring</b> |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Passivated inner ring                                                   |   |     |   |      |   |   |    |    |     |      |
| CP6 <sup>1)</sup>                      | Chromium plated sphere                                                  |   |     |   |      |   |   |    |    |     |      |
| CP109 <sup>1)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |     |   |      |   |   |    |    |     |      |
| <b>Over-size</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Standard outer diameter size                                            |   |     |   |      |   |   |    |    |     |      |
| RP01 <sup>1)</sup>                     | 0.010 in/0,254 mm oversized outer diameter                              |   |     |   |      |   |   |    |    |     |      |
| RP02 <sup>1)</sup>                     | 0.020 in/0,508 mm oversized outer diameter                              |   |     |   |      |   |   |    |    |     |      |

1) SKF option

2) In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

3) Only available for  $d \geq 7,94$

## Loads and clearance

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Static limit loads <sup>5)</sup> |                                       | Standard clearances    |               | Reduced clearances    |              |
|-------------------|---------------------------------------|----------------------------------|---------------------------------------|------------------------|---------------|-----------------------|--------------|
|                   |                                       | Radial<br>C <sub>s</sub>         | Axial<br>C <sub>a</sub> <sup>4)</sup> | Radial                 | Axial<br>max  | Radial                | Axial<br>max |
| –                 |                                       | lbf/kN                           |                                       | in/μm                  |               |                       |              |
| 4,83              | 03                                    | 6 300<br>28                      | 2 475<br>11                           | 0.0004/0.0012<br>10/30 | 0.0050<br>127 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 6,35              | 04                                    | 9 450<br>42                      | 3 600<br>16                           | 0.0004/0.0012<br>10/30 | 0.0050<br>127 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 7,94              | 05                                    | 12 825<br>57                     | 5 175<br>23                           | 0.0004/0.0012<br>10/30 | 0.0050<br>127 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 9,52              | 06                                    | 15 750<br>70                     | 5 625<br>25                           | 0.0004/0.0012<br>10/30 | 0.0050<br>127 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 11,11             | 07                                    | 19 125<br>85                     | 7 650<br>34                           | 0.0004/0.0012<br>10/30 | 0.0050<br>127 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 12,7              | 08                                    | 24 750<br>110                    | 8 775<br>39                           | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 14,29             | 09                                    | 32 400<br>144                    | 10 575<br>47                          | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0001/0.0005<br>3/12 | 0.0016<br>40 |
| 15,87             | 10                                    | 41 175<br>183                    | 14 175<br>63                          | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0001/0.0005<br>3/12 | 0.0016<br>40 |

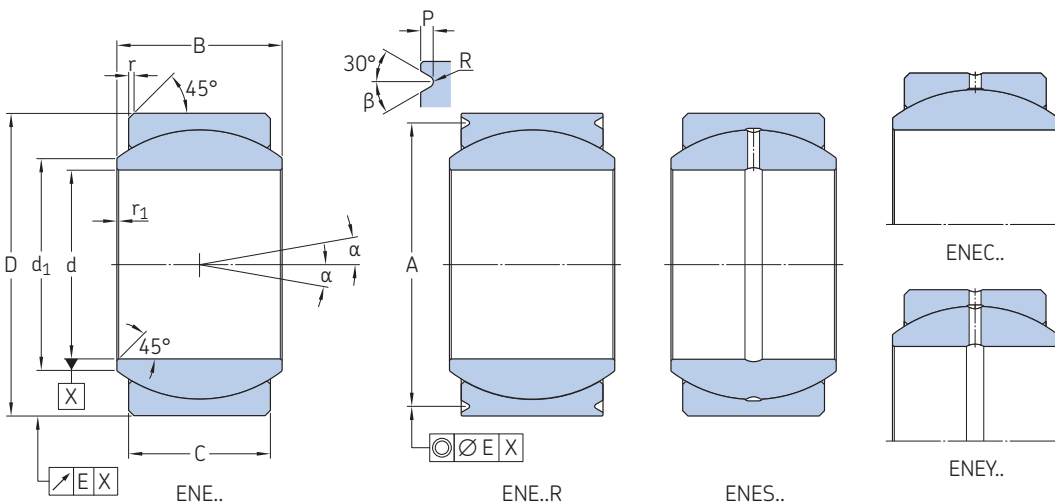
4) These values can be limited by unstaking load (contact SKF for more information)

5) Loads are valid for the spherical plain bearings without lubrication groove. For other bearings, refer to page 134

6) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## 2.12 Metal-to-metal swaged narrow (inch dimensions)

ENE.. bore code 19,05 to 50,8



|                                |                                                     |
|--------------------------------|-----------------------------------------------------|
| <b>Technical specification</b> | EN 2337                                             |
| <b>Product standards</b>       | EN 6046                                             |
| <b>Materials</b>               | Corrosion-resistant steel inner ring and outer ring |

| d                             | β  | E              |
|-------------------------------|----|----------------|
| in/mm                         | °  | in/mm          |
| 0.1900/0.3125<br>4,826/7,938  | 20 | 0.003<br>0,076 |
| 0.3750/1.7500<br>9,525/44,450 | 30 | 0.005<br>0,127 |

### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d     | Δdmp                   | Δds                                | D                | ΔDmp                  | ΔDs                                | C<br>+0.005/0<br>+0,127/0 | B<br>0/-0.002<br>0/-0,051 |
|-------------------|------------------------------------|------------------|------------------------|------------------------------------|------------------|-----------------------|------------------------------------|---------------------------|---------------------------|
|                   |                                    | in/mm            |                        |                                    |                  |                       |                                    |                           |                           |
| 19,05             | 12                                 | 0.7500<br>19,050 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127             | 1.4375<br>36,513 | 0/-0.0004<br>0/-0,011 | 0/-0.0005<br>0/-0,0127             | 0.593<br>15,062           | 0.750<br>19,050           |
| 22,22             | 14                                 | 0.8750<br>22,225 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127             | 1.5625<br>39,688 | 0/-0.0004<br>0/-0,011 | 0/-0.0005<br>0/-0,0127             | 0.703<br>17,856           | 0.875<br>22,225           |
| 25,4              | 16                                 | 1.0000<br>25,400 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.7500<br>44,450 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 0.797<br>20,244           | 1.000<br>25,400           |
| 31,75             | 20                                 | 1.2500<br>31,750 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 2.0000<br>50,800 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 0.942<br>23,927           | 1.093<br>27,762           |
| 38,10             | 24                                 | 1.5000<br>38,100 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 2.4375<br>61,913 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.130<br>28,702           | 1.312<br>33,325           |
| 44,45             | 28                                 | 1.7500<br>44,450 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 2.8125<br>71,438 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.317<br>33,452           | 1.531<br>38,887           |
| 50,8              | 32                                 | 2.0000<br>50,800 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 3.1875<br>80,963 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.505<br>38,227           | 1.750<br>44,450           |

### Dimensions cont.

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d1   | r1<br>±0.005<br>±0,127 | r<br>0/-0.010<br>0/-0,254 | A<br>0/-0.008<br>0/-0,203 | P<br>0/-0.010<br>0/-0,254 | R                          | α <sup>(6)</sup> | Mass<br>≈   |
|-------------------|------------------------------------|-----------------|------------------------|---------------------------|---------------------------|---------------------------|----------------------------|------------------|-------------|
|                   |                                    | in/mm           |                        |                           |                           |                           |                            |                  | lb/g        |
| 19,05             | 12                                 | 0.920<br>23,368 | 0.010<br>0,254         | 0.040<br>1,016            | 1.313<br>33,350           | 0.055<br>1,400            | 0.010/0.017<br>0,254/0,432 | 9                | 0.21<br>95  |
| 22,22             | 14                                 | 0.980<br>24,892 | 0.010<br>0,254         | 0.040<br>1,016            | 1.438<br>36,525           | 0.055<br>1,400            | 0.010/0.017<br>0,254/0,432 | 9                | 0.27<br>122 |
| 25,4              | 16                                 | 1.118<br>28,397 | 0.010<br>0,254         | 0.040<br>1,016            | 1.626<br>41,300           | 0.055<br>1,400            | 0.010/0.017<br>0,254/0,432 | 9                | 0.38<br>173 |
| 31,75             | 20                                 | 1.445<br>36,700 | 0.010<br>0,254         | 0.040<br>1,016            | 1.876<br>47,650           | 0.055<br>1,400            | 0.010/0.017<br>0,254/0,432 | 6                | 0.53<br>240 |
| 38,10             | 24                                 | 1.870<br>47,500 | 0.010<br>0,254         | 0.040<br>1,016            | 2.313<br>58,750           | 0.055<br>1,400            | 0.010/0.017<br>0,254/0,432 | 6                | 0.97<br>439 |
| 44,45             | 28                                 | 1.996<br>50,698 | 0.010<br>0,254         | 0.040<br>1,016            | 2.688<br>68,275           | 0.055<br>1,400            | 0.010/0.017<br>0,254/0,432 | 6                | 1.47<br>668 |
| 50,8              | 32                                 | 2.440<br>61,976 | 0.010<br>0,254         | 0.040<br>1,016            | 3.064<br>77,826           | 0.055<br>1,400            | 0.010/0.017<br>0,254/0,432 | 5                | 2.16<br>980 |

**Designation system**

|                                        |                                                                         |   |     |   |      |   |   |    |    |     |      |
|----------------------------------------|-------------------------------------------------------------------------|---|-----|---|------|---|---|----|----|-----|------|
| Examples:                              | ZENES12,7RXTT-2CP6RP01                                                  | Z | ENE | S | 12,7 | R | X | TT | -2 | CP6 | RP01 |
|                                        | ENEC25,4PPCP109                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Surface treatment of outer ring</b> |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Not plated                                                              |   |     |   |      |   |   |    |    |     |      |
| Z                                      | Cadmium plated external dimensions                                      |   |     |   |      |   |   |    |    |     |      |
| SZ <sup>1)</sup>                       | Zinc-nickel plated external dimensions                                  |   |     |   |      |   |   |    |    |     |      |
| <b>Basic designation</b>               |                                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Lubrication grooves</b>             |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Without lubrication groove                                              |   |     |   |      |   |   |    |    |     |      |
| S                                      | Lubrication by inner ring                                               |   |     |   |      |   |   |    |    |     |      |
| C <sup>2)</sup>                        | Lubrication by outer ring                                               |   |     |   |      |   |   |    |    |     |      |
| Y <sup>1)</sup>                        | Lubrication by inner and outer ring                                     |   |     |   |      |   |   |    |    |     |      |
| <b>Bore code</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Chamfer and groove</b>              |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Chamfered outer ring                                                    |   |     |   |      |   |   |    |    |     |      |
| R                                      | Grooved outer ring                                                      |   |     |   |      |   |   |    |    |     |      |
| <b>Clearances</b>                      |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Standard clearances                                                     |   |     |   |      |   |   |    |    |     |      |
| X                                      | Reduced clearances                                                      |   |     |   |      |   |   |    |    |     |      |
| <b>Shield and seal</b>                 |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | No shield and seal                                                      |   |     |   |      |   |   |    |    |     |      |
| TT <sup>1) 3)</sup>                    | Sealed                                                                  |   |     |   |      |   |   |    |    |     |      |
| PP <sup>1) 3)</sup>                    | shielded                                                                |   |     |   |      |   |   |    |    |     |      |
| <b>Lubricant</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Grease G354                                                             |   |     |   |      |   |   |    |    |     |      |
| -2                                     | Grease G395                                                             |   |     |   |      |   |   |    |    |     |      |
| <b>Surface treatment of inner ring</b> |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Passivated inner ring                                                   |   |     |   |      |   |   |    |    |     |      |
| CP6 <sup>1)</sup>                      | Chromium plated sphere                                                  |   |     |   |      |   |   |    |    |     |      |
| CP109 <sup>1)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |     |   |      |   |   |    |    |     |      |
| <b>Oversize</b>                        |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Standard outer diameter size                                            |   |     |   |      |   |   |    |    |     |      |
| RP01 <sup>1)</sup>                     | 0.010 in/0,254 mm oversized outer diameter                              |   |     |   |      |   |   |    |    |     |      |
| RP02 <sup>1)</sup>                     | 0.020 in/0,508 mm oversized outer diameter                              |   |     |   |      |   |   |    |    |     |      |

1) SKF option

2) In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$ 3) Only available for  $d \geq 7,94$ **Loads and clearance**

| Nominal bore code | Dash number multiples of 1/16 inch | Static limit loads <sup>5)</sup> |                                    | Standard clearances    |               | Reduced clearances     |              |
|-------------------|------------------------------------|----------------------------------|------------------------------------|------------------------|---------------|------------------------|--------------|
|                   |                                    | Radial C <sub>s</sub>            | Axial C <sub>a</sub> <sup>4)</sup> | Radial                 | Axial max     | Radial                 | Axial max    |
| –                 |                                    | lbf/kN                           |                                    | in/μm                  |               |                        |              |
| 19,05             | 12                                 | 59 850<br>266                    | 19 125<br>85                       | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.00015/0.0006<br>4/15 | 0.0020<br>50 |
| 22,22             | 14                                 | 78 750<br>350                    | 27 900<br>124                      | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.00015/0.0006<br>4/15 | 0.0020<br>50 |
| 25,4              | 16                                 | 101 700<br>452                   | 35 550<br>158                      | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.00015/0.0006<br>4/15 | 0.0020<br>50 |
| 31,75             | 20                                 | 142 875<br>636                   | 52 875<br>235                      | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.00015/0.0006<br>4/15 | 0.0020<br>50 |
| 38,10             | 24                                 | 216 675<br>964                   | 81 675<br>363                      | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0001/0.0004<br>4/15  | 0.0020<br>50 |
| 44,45             | 28                                 | 282 375<br>1 256                 | 108 000<br>480                     | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.00015/0.0006<br>4/15 | 0.0020<br>50 |
| 50,8              | 32                                 | 387 000<br>1 721                 | 148 725<br>662                     | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0002/0.0008<br>5/20  | 0.0024<br>60 |

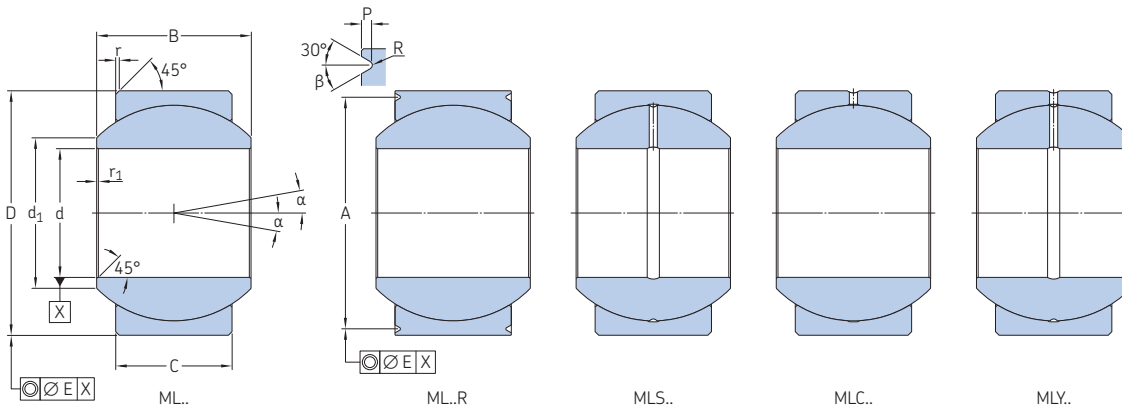
4) These values can be limited by unstaking load (contact SKF for more information)

5) Loads are valid for the spherical plain bearings without lubrication groove. For other bearings, refer to page 134

6) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## 2.13 Metal-to-metal swaged wide (inch dimensions)

ML.. bore code 4,83 to 15,87



Technical specification –  
Product standards –

| d                                   | β  | E              |
|-------------------------------------|----|----------------|
| in/mm                               | °  | in/mm          |
| 0.1900/<br>0.2500<br>4,826/<br>6,35 | 20 | 0.003<br>0,076 |
| 0.3125<br>7,938                     | 30 | 0.003<br>0,076 |
| 0.3750/<br>2.0000<br>9,525/<br>50,8 | 30 | 0.005<br>0,127 |

### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d           | D                      | C                | B                    | d <sub>1</sub>  | r <sub>1</sub>   | r                    | A                    | P                    |
|-------------------|------------------------------------|------------------------|------------------------|------------------|----------------------|-----------------|------------------|----------------------|----------------------|----------------------|
|                   |                                    | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | ±0.005<br>±0,127 | 0/-0.002<br>0/-0,051 | ≈               | ±0.005<br>±0,127 | 0.010/-0<br>0,254/-0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |
| in/mm             |                                    |                        |                        |                  |                      |                 |                  |                      |                      |                      |
| 4,83              | 03                                 | 0.1900<br>4,826        | 0.6250<br>15,875       | 0.327<br>8,306   | 0.437<br>11,100      | 0.300<br>7,620  | 0.010<br>0,254   | 0.015<br>0,381       | 0.563<br>14,300      | 0.025<br>0,635       |
| 6,35              | 04                                 | 0.2500<br>6,350        | 0.6250<br>15,875       | 0.327<br>8,306   | 0.437<br>11,100      | 0.300<br>7,620  | 0.010<br>0,254   | 0.015<br>0,381       | 0.563<br>14,300      | 0.025<br>0,635       |
| 7,94              | 05                                 | 0.3125<br>7,938        | 0.6875<br>17,462       | 0.317<br>8,052   | 0.437<br>11,100      | 0.360<br>9,140  | 0.010<br>0,254   | 0.015<br>0,381       | 0.625<br>15,875      | 0.025<br>0,635       |
| 9,52              | 06                                 | 0.3750<br>9,525        | 0.8125<br>20,638       | 0.406<br>10,312  | 0.500<br>12,700      | 0.466<br>11,840 | 0.010<br>0,254   | 0.020<br>0,508       | 0.712<br>18,085      | 0.035<br>0,889       |
| 11,11             | 07                                 | 0.4375<br>11,113       | 0.9375<br>23,812       | 0.442<br>11,227  | 0.562<br>14,275      | 0.537<br>13,64  | 0.010<br>0,254   | 0.020<br>0,508       | 0.837<br>21,260      | 0.035<br>0,889       |
| 12,7              | 08                                 | 0.5000<br>12,700       | 1.0000<br>25,400       | 0.505<br>12,827  | 0.625<br>15,875      | 0.607<br>15,420 | 0.010<br>0,254   | 0.020<br>0,508       | 0.900<br>22,860      | 0.035<br>0,889       |
| 14,29             | 09                                 | 0.5625<br>14,288       | 1.1250<br>28,575       | 0.536<br>13,614  | 0.687<br>17,450      | 0.721<br>18,310 | 0.010<br>0,254   | 0.020<br>0,508       | 1.025<br>26,035      | 0.035<br>0,889       |
| 15,87             | 10                                 | 0.6250<br>15,875       | 1.1875<br>30,163       | 0.567<br>14,400  | 0.750<br>19,050      | 0.747<br>18,970 | 0.010<br>0,254   | 0.020<br>0,508       | 1.087<br>27,610      | 0.035<br>0,889       |

### Dimensions cont., loads and clearance

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions R               | α <sup>3)</sup> | Mass ≈      | Static limit loads <sup>2)</sup> Radial | Axial                        | Axial clearance Standard | Reduced               |
|-------------------|------------------------------------|----------------------------|-----------------|-------------|-----------------------------------------|------------------------------|--------------------------|-----------------------|
|                   |                                    | in/mm                      | °               | lb/g        | C <sub>s</sub>                          | C <sub>a</sub> <sup>1)</sup> | in/μm                    |                       |
| 4,83              | 03                                 | 0.005/0.012<br>0,127/0,305 | 15              | 0.03<br>14  | 12 150<br>54                            | 5 175<br>23                  | 0.0020/0.0040<br>50/100  | 0.0002/0.0020<br>5/50 |
| 6,35              | 04                                 | 0.005/0.012<br>0,127/0,305 | 15              | 0.03<br>14  | 13 725<br>61                            | 5 850<br>26                  | 0.0020/0.0040<br>50/100  | 0.0002/0.0020<br>5/50 |
| 7,94              | 05                                 | 0.005/0.012<br>0,127/0,305 | 14              | 0.035<br>16 | 14 175<br>63                            | 5 400<br>24                  | 0.0020/0.0040<br>50/100  | 0.0002/0.0020<br>5/50 |
| 9,52              | 06                                 | 0.010/0.017<br>0,254/0,432 | 8               | 0.06<br>27  | 21 375<br>95                            | 8 325<br>37                  | 0.0020/0.0040<br>50/100  | 0.0002/0.0020<br>5/50 |
| 11,11             | 07                                 | 0.010/0.017<br>0,254/0,432 | 10              | 0.08<br>38  | 27 000<br>120                           | 10 575<br>47                 | 0.0020/0.0040<br>50/100  | 0.0002/0.0020<br>5/50 |
| 12,7              | 08                                 | 0.010/0.017<br>0,254/0,432 | 9               | 0.10<br>45  | 35 550<br>158                           | 13 950<br>62                 | 0.0020/0.0040<br>50/100  | 0.0002/0.0020<br>5/50 |
| 14,29             | 09                                 | 0.010/0.017<br>0,254/0,432 | 10              | 0.14<br>61  | 43 875<br>195                           | 16 200<br>72                 | 0.0020/0.0040<br>50/100  | 0.0002/0.0020<br>5/50 |
| 15,87             | 10                                 | 0.010/0.017<br>0,254/0,432 | 12              | 0.16<br>73  | 49 500<br>220                           | 17 775<br>79                 | 0.0020/0.0040<br>50/100  | 0.0002/0.0020<br>5/50 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140



## Designation system

Examples: ZWQMLS12,7RXTT-2CP6RP01      Z    WQ    ML    S    12,7    R    X    TT    -2    CP6    RP01  
QML25,4PPCP109

### Surface treatment of outer ring

**No code** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

**Material code**    **Inner ring material**    **External ring material**  
**W** Corrosion-resistant steel    Corrosion-resistant steel  
**Q** Bronze beryllium    Corrosion-resistant steel  
**WQ** Corrosion-resistant steel    Bronze aluminium

### Basic designation

#### Lubrication grooves

**No code** Without lubrication groove  
**S** Lubrication by inner ring  
**C<sup>3)</sup>** Lubrication by outer ring  
**Y** Lubrication by inner and outer ring

#### Bore code

#### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

#### Axial clearance

**No code** Standard axial clearance  
**X** Reduced axial clearance

#### Shield and seal

**No code** No shield and seal  
**TT<sup>4)</sup>** Sealed  
**PP<sup>4)</sup>** Shielded

#### Lubricant

**No code** Grease G354  
**-2** Grease G395

### Surface treatment of inner ring

**No code** Not plated  
**CP6<sup>2)</sup>** Chromium plated  
**CP109<sup>2)</sup>** XCR plating on sphere (chromium 6 free replacement to chromium plating)  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel inner ring

#### Oversize

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

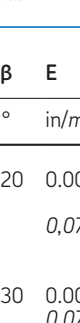
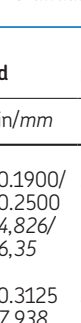
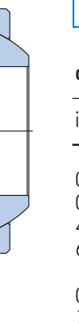
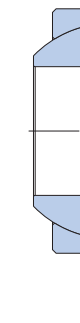
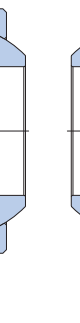
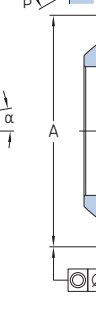
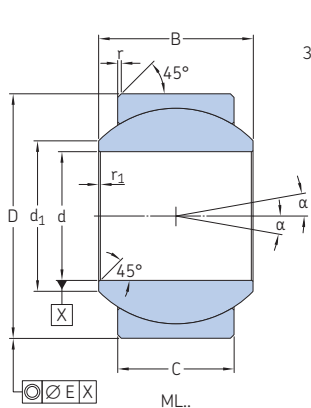
<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

<sup>4)</sup> Only available for  $d \geq 7,94$

## 2.13 Metal-to-metal swaged wide (inch dimensions)

ML.. bore code **19,05** to **50,8**



Technical specification –  
Product standards –

| d                                   | β  | E                  |
|-------------------------------------|----|--------------------|
| in/mm                               | °  | in/mm              |
| 0.1900/<br>0.2500<br>4,826/<br>6,35 | 20 | 0.003<br><br>0,076 |
| 0.3125/<br>7,938                    | 30 | 0.003<br>0,076     |
| 0.3750/<br>2.0000<br>9,525/<br>50,8 | 30 | 0.005<br><br>0,127 |

### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d           | D                      | C                | B                    | d <sub>1</sub>  | r <sub>1</sub>   | r                    | A                    | P                    |
|-------------------|------------------------------------|------------------------|------------------------|------------------|----------------------|-----------------|------------------|----------------------|----------------------|----------------------|
|                   |                                    | 0/–0.0005<br>0/–0,0127 | 0/–0.0005<br>0/–0,0127 | ±0.005<br>±0,127 | 0/–0.002<br>0/–0,051 | ≈               | ±0.005<br>±0,127 | +0.010/0<br>+0,254/0 | 0/–0.008<br>0/–0,203 | 0/–0.010<br>0/–0,254 |
| –                 |                                    | in/mm                  |                        |                  |                      |                 |                  |                      |                      |                      |
| <b>19,05</b>      | <b>12</b>                          | 0.7500<br>19,050       | 1.3750<br>34,925       | 0.630<br>16,002  | 0.875<br>22,225      | 0.845<br>21,460 | 0.010<br>0,254   | 0.030<br>0,762       | 1.251<br>31,775      | 0.055<br>1,397       |
| <b>22,22</b>      | <b>14</b>                          | 0.8750<br>22,225       | 1.6250<br>41,275       | 0.755<br>19,177  | 0.875<br>22,225      | 0.995<br>25,270 | 0.010<br>0,254   | 0.030<br>0,762       | 1.501<br>38,125      | 0.055<br>1,397       |
| <b>25,4</b>       | <b>16</b>                          | 1.0000<br>25,400       | 2.1250<br>53,975       | 1.005<br>25,527  | 1.375<br>34,925      | 1.269<br>32,230 | 0.010<br>0,254   | 0.030<br>0,762       | 2.001<br>50,825      | 0.055<br>1,397       |
| <b>31,75</b>      | <b>20</b>                          | 1.2500<br>31,750       | 2.3750<br>60,325       | 1.130<br>28,702  | 1.500<br>38,100      | 1.462<br>37,150 | 0.010<br>0,254   | 0.030<br>0,762       | 2.253<br>57,230      | 0.060<br>1,524       |
| <b>38,10</b>      | <b>24</b>                          | 1.5000<br>38,100       | 2.6875<br>68,260       | 1.223<br>31,064  | 1.687<br>42,850      | 1.697<br>43,100 | 0.010<br>0,254   | 0.030<br>0,762       | 2.565<br>65,160      | 0.060<br>1,524       |
| <b>44,45</b>      | <b>28</b>                          | 1.7500<br>44,450       | 3.0000<br>76,200       | 1.317<br>33,452  | 1.812<br>46,020      | 1.965<br>49,900 | 0.010<br>0,254   | 0.030<br>0,762       | 2.878<br>73,100      | 0.060<br>1,524       |
| <b>50,8</b>       | <b>32</b>                          | 2.0000<br>50,800       | 3.2500<br>82,550       | 1.380<br>35,050  | 1.937<br>49,190      | 2.209<br>56,100 | 0.010<br>0,254   | 0.030<br>0,762       | 3.128<br>79,451      | 0.060<br>1,524       |

### Dimensions cont., loads and clearance

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions R               | α <sup>3)</sup> | Mass ≈        | Static limit loads <sup>2)</sup><br>Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>1)</sup> | Axial clearance<br>Standard | Reduced               |
|-------------------|------------------------------------|----------------------------|-----------------|---------------|-----------------------------------------------------------|------------------------------------|-----------------------------|-----------------------|
| –                 |                                    | in/mm                      | °               | lb/g          | lbf/kN                                                    |                                    | in/μm                       |                       |
| <b>19,05</b>      | <b>12</b>                          | 0.010/0.017<br>0.254/0.432 | 13              | 0.24<br>109   | 64 125<br>285                                             | 20 925<br>93                       | 0.0020/0.0040<br>50/100     | 0.0002/0.0020<br>5/50 |
| <b>22,22</b>      | <b>14</b>                          | 0.010/0.017<br>0.254/0.432 | 6               | 0.35<br>159   | 83 250<br>370                                             | 31 725<br>141                      | 0.0024/0.0047<br>60/120     | 0.0002/0.0024<br>5/60 |
| <b>25,4</b>       | <b>16</b>                          | 0.010/0.017<br>0.254/0.432 | 12              | 0.97<br>440   | 158 625<br>706                                            | 59 625<br>265                      | 0.0024/0.0047<br>60/120     | 0.0002/0.0024<br>5/60 |
| <b>31,75</b>      | <b>20</b>                          | 0.010/0.020<br>0.254/0.508 | 12              | 1.10<br>500   | 200 250<br>891                                            | 76 500<br>340                      | 0.0024/0.0047<br>60/120     | 0.0002/0.0024<br>5/60 |
| <b>38,10</b>      | <b>24</b>                          | 0.010/0.020<br>0.254/0.508 | 13              | 1.54<br>700   | 247 500<br>1 101                                          | 92 250<br>410                      | 0.0024/0.0047<br>60/120     | 0.0002/0.0024<br>5/60 |
| <b>44,45</b>      | <b>28</b>                          | 0.010/0.020<br>0.254/0.508 | 12              | 1.99<br>900   | 299 250<br>1 331                                          | 108 000<br>480                     | 0.0024/0.0047<br>60/120     | 0.0002/0.0024<br>5/60 |
| <b>50,8</b>       | <b>32</b>                          | 0.010/0.020<br>0.254/0.508 | 12              | 2.31<br>1 050 | 344 250<br>1 531                                          | 117 000<br>520                     | 0.0024/0.0047<br>60/120     | 0.0002/0.0024<br>5/60 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## Designation system

|                                        |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
|----------------------------------------|-------------------------|-------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|-------------------------------|----|----|---|------|---|---|----|----|-----|------|--|
| Examples:                              | ZWQMLS12,7RXTT-2CP6RP01 |                                                                         |  |  |  |  |  |  |  |  |  | Z                             | WQ | ML | S | 12,7 | R | X | TT | -2 | CP6 | RP01 |  |
|                                        | QML25,4PPCP109          |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Surface treatment of outer ring</b> |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>No code</b>                         |                         | Not plated                                                              |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Z</b>                               |                         | Cadmium plated external dimensions                                      |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>SZ</b>                              |                         | Zinc-nickel plated external dimensions                                  |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Material code</b>                   |                         | <b>Inner ring material</b>                                              |  |  |  |  |  |  |  |  |  | <b>External ring material</b> |    |    |   |      |   |   |    |    |     |      |  |
| <b>W</b>                               |                         | Corrosion-resistant steel                                               |  |  |  |  |  |  |  |  |  | Corrosion-resistant steel     |    |    |   |      |   |   |    |    |     |      |  |
| <b>Q</b>                               |                         | Bronze beryllium                                                        |  |  |  |  |  |  |  |  |  | Corrosion-resistant steel     |    |    |   |      |   |   |    |    |     |      |  |
| <b>WQ</b>                              |                         | Corrosion-resistant steel                                               |  |  |  |  |  |  |  |  |  | Bronze aluminium              |    |    |   |      |   |   |    |    |     |      |  |
| <b>Basic designation</b>               |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Lubrication grooves</b>             |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>No code</b>                         |                         | Without lubrication groove                                              |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>S</b>                               |                         | Lubrication by inner ring                                               |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>C<sup>3)</sup></b>                  |                         | Lubrication by outer ring                                               |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Y</b>                               |                         | Lubrication by inner and outer ring                                     |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Bore code</b>                       |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Chamfer and groove</b>              |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>No code</b>                         |                         | Chamfered outer ring                                                    |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>R</b>                               |                         | Grooved outer ring                                                      |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Axial clearance</b>                 |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>No code</b>                         |                         | Standard axial clearance                                                |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>X</b>                               |                         | Reduced axial clearance                                                 |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Shield and seal</b>                 |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>No code</b>                         |                         | No shield and seal                                                      |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>TT<sup>4)</sup></b>                 |                         | Sealed                                                                  |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>PP<sup>4)</sup></b>                 |                         | Shielded                                                                |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Lubricant</b>                       |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>No code</b>                         |                         | Grease G354                                                             |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>-2</b>                              |                         | Grease G395                                                             |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Surface treatment of inner ring</b> |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>No code</b>                         |                         | Not plated                                                              |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>CP6<sup>2)</sup></b>                |                         | Chromium plated                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>CP109<sup>2)</sup></b>              |                         | XCR plating on sphere (chromium 6 free replacement to chromium plating) |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>CP55<sup>2)</sup></b>               |                         | Passivated corrosion-resistant steel inner ring                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>Oversize</b>                        |                         |                                                                         |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>No code</b>                         |                         | Standard outer diameter size                                            |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>RP01</b>                            |                         | 0.010 in/0,254 mm oversized outer diameter                              |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |
| <b>RP02</b>                            |                         | 0.020 in/0,508 mm oversized outer diameter                              |  |  |  |  |  |  |  |  |  |                               |    |    |   |      |   |   |    |    |     |      |  |

<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

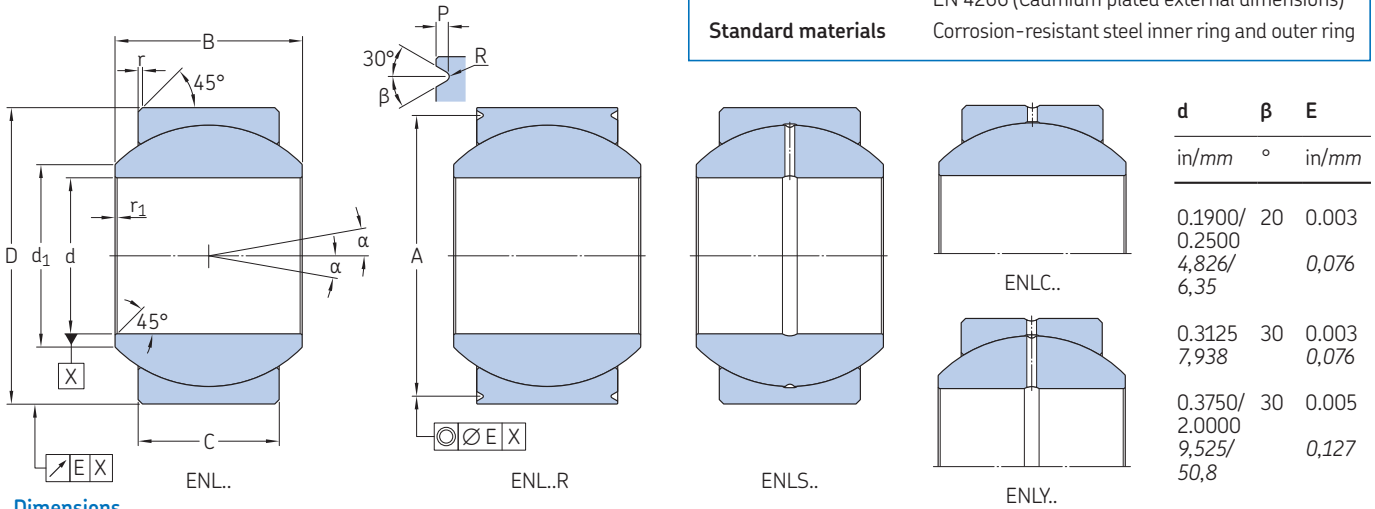
<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

<sup>4)</sup> Only available for  $d \geq 7,94$

## 2.14 Metal-to-metal swaged wide (inch dimensions)

ENL.. bore code 4,83 to 14,29

|                                |                                                                      |
|--------------------------------|----------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2337                                                              |
| <b>Product standards</b>       | EN 4265 (Not plated)<br>EN 4266 (Cadmium plated external dimensions) |
| <b>Standard materials</b>      | Corrosion-resistant steel inner ring and outer ring                  |



### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d     | Δdmp                   | Δds                    | D                | ΔDmp                  | ΔDs                    | C<br>+0.005/0<br>+0.127/0 | B<br>0/-0.002<br>0/-0.051 |
|-------------------|------------------------------------|------------------|------------------------|------------------------|------------------|-----------------------|------------------------|---------------------------|---------------------------|
| in/mm             |                                    |                  |                        |                        |                  |                       |                        |                           |                           |
| 4,83              | 03                                 | 0.1900<br>4,826  | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 0.6250<br>15,875 | 0/-0.0003<br>0/-0.008 | 0/-0.0005<br>0/-0.0127 | 0.327<br>8,306            | 0.437<br>11,100           |
| 6,35              | 04                                 | 0.2500<br>6,350  | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 0.6250<br>15,875 | 0/-0.0003<br>0/-0.008 | 0/-0.0005<br>0/-0.0127 | 0.327<br>8,306            | 0.437<br>11,100           |
| 7,94              | 05                                 | 0.3125<br>7,938  | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 0.6875<br>17,462 | 0/-0.0003<br>0/-0.008 | 0/-0.0005<br>0/-0.0127 | 0.317<br>8,052            | 0.437<br>11,100           |
| 9,52              | 06                                 | 0.3750<br>9,525  | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 0.8125<br>20,638 | 0/-0.0004<br>0/-0.009 | 0/-0.0005<br>0/-0.0127 | 0.405<br>10,287           | 0.500<br>12,700           |
| 11,11             | 07                                 | 0.4375<br>11,113 | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 0.9375<br>23,812 | 0/-0.0004<br>0/-0.009 | 0/-0.0005<br>0/-0.0127 | 0.442<br>11,227           | 0.562<br>14,275           |
| 11,11..DS         | 07A                                | 0.4375<br>11,113 | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 0.9062<br>23,017 | 0/-0.0004<br>0/-0.009 | 0/-0.0005<br>0/-0.0127 | 0.442<br>11,227           | 0.562<br>14,275           |
| 12,7              | 08                                 | 0.5000<br>12,700 | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 1.0000<br>25,400 | 0/-0.0004<br>0/-0.009 | 0/-0.0005<br>0/-0.0127 | 0.505<br>12,827           | 0.625<br>15,875           |
| 14,29             | 09                                 | 0.5625<br>14,288 | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 1.1250<br>28,575 | 0/-0.0004<br>0/-0.009 | 0/-0.0005<br>0/-0.0127 | 0.536<br>13,614           | 0.687<br>17,450           |

### Dimensions cont.

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d1  | r1<br>±0.005<br>±0.127 | r<br>+0.010/0<br>+0.254/0 | A<br>0/-0.008<br>0/-0.203 | P<br>0/-0.010<br>0/-0.250 | R                          | α <sup>7)</sup> | Mass<br>≈  |
|-------------------|------------------------------------|----------------|------------------------|---------------------------|---------------------------|---------------------------|----------------------------|-----------------|------------|
| in/mm             |                                    |                |                        |                           |                           |                           |                            |                 | lb/g       |
| 4,83              | 03                                 | 0.300<br>7,62  | 0.010<br>0,254         | 0.015<br>0,381            | 0.563<br>14,300           | 0.025<br>0,640            | 0.005/0.010<br>0,127/0,254 | 16              | 0.03<br>13 |
| 6,35              | 04                                 | 0.300<br>7,62  | 0.010<br>0,254         | 0.015<br>0,381            | 0.563<br>14,300           | 0.025<br>0,640            | 0.005/0.010<br>0,127/0,254 | 16              | 0.03<br>12 |
| 7,94              | 05                                 | 0.360<br>9,14  | 0.010<br>0,254         | 0.015<br>0,381            | 0.625<br>15,875           | 0.025<br>0,640            | 0.005/0.010<br>0,127/0,254 | 16              | 0.03<br>13 |
| 9,52              | 06                                 | 0.466<br>11,84 | 0.010<br>0,254         | 0.015<br>0,381            | 0.712<br>18,085           | 0.035<br>0,890            | 0.010/0.017<br>0,254/0,432 | 10              | 0.05<br>23 |
| 11,11             | 07                                 | 0.537<br>13,64 | 0.010<br>0,254         | 0.020<br>0,508            | 0.837<br>21,260           | 0.035<br>0,890            | 0.010/0.017<br>0,254/0,432 | 11              | 0.07<br>33 |
| 11,11..DS         | 07A                                | 0.537<br>13,64 | 0.010<br>0,254         | -                         | 0.808<br>20,520           | 0.035<br>0,890            | 0.010/0.017<br>0,254/0,432 | 11              | 0.07<br>30 |
| 12,7              | 08                                 | 0.607<br>15,42 | 0.010<br>0,254         | 0.020<br>0,508            | 0.900<br>22,860           | 0.035<br>0,890            | 0.010/0.017<br>0,254/0,432 | 10              | 0.09<br>40 |
| 14,29             | 09                                 | 0.721<br>18,31 | 0.010<br>0,254         | 0.020<br>0,508            | 1.025<br>26,035           | 0.035<br>0,890            | 0.010/0.017<br>0,254/0,432 | 11              | 0.12<br>56 |

## Designation system

|                                        |                                                                         |   |     |   |      |   |   |    |    |     |      |
|----------------------------------------|-------------------------------------------------------------------------|---|-----|---|------|---|---|----|----|-----|------|
| Examples:                              | ZENLS12,7RXTT-2CP6RP01                                                  | Z | ENL | S | 12,7 | R | X | TT | -2 | CP6 | RP01 |
|                                        | ENLC11,11RDSPPCP109                                                     |   |     |   |      |   |   |    |    |     |      |
| <b>Surface treatment of outer ring</b> |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Not plated                                                              |   |     |   |      |   |   |    |    |     |      |
| Z                                      | Cadmium plated external dimensions                                      |   |     |   |      |   |   |    |    |     |      |
| SZ <sup>1)</sup>                       | Zinc-nickel plated external dimensions                                  |   |     |   |      |   |   |    |    |     |      |
| <b>Basic designation</b>               |                                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Lubrication grooves</b>             |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Without lubrication groove                                              |   |     |   |      |   |   |    |    |     |      |
| S                                      | Lubrication by inner ring                                               |   |     |   |      |   |   |    |    |     |      |
| C <sup>3)</sup>                        | Lubrication by outer ring                                               |   |     |   |      |   |   |    |    |     |      |
| Y <sup>1)</sup>                        | Lubrication by inner and outer ring                                     |   |     |   |      |   |   |    |    |     |      |
| <b>Bore code</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Chamfer and groove</b>              |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code <sup>2)</sup>                  | Chamfered outer ring                                                    |   |     |   |      |   |   |    |    |     |      |
| R                                      | Grooved outer ring                                                      |   |     |   |      |   |   |    |    |     |      |
| <b>Clearances</b>                      |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Standard clearances                                                     |   |     |   |      |   |   |    |    |     |      |
| X                                      | Reduced clearances                                                      |   |     |   |      |   |   |    |    |     |      |
| <b>Shield and seal</b>                 |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | No shield and seal                                                      |   |     |   |      |   |   |    |    |     |      |
| TT <sup>1) 4)</sup>                    | Sealed                                                                  |   |     |   |      |   |   |    |    |     |      |
| PP <sup>1) 4)</sup>                    | shielded                                                                |   |     |   |      |   |   |    |    |     |      |
| <b>Lubricant</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Grease G354                                                             |   |     |   |      |   |   |    |    |     |      |
| -2                                     | Grease G395                                                             |   |     |   |      |   |   |    |    |     |      |
| <b>Surface treatment of inner ring</b> |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Passivated inner ring                                                   |   |     |   |      |   |   |    |    |     |      |
| CP6 <sup>1)</sup>                      | Chromium plated sphere                                                  |   |     |   |      |   |   |    |    |     |      |
| CP109 <sup>1)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |     |   |      |   |   |    |    |     |      |
| <b>Over-size</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Standard outer diameter size                                            |   |     |   |      |   |   |    |    |     |      |
| RP01 <sup>1)</sup>                     | 0.010 in/0,254 mm oversized outer diameter                              |   |     |   |      |   |   |    |    |     |      |
| RP02 <sup>1)</sup>                     | 0.020 in/0,508 mm oversized outer diameter                              |   |     |   |      |   |   |    |    |     |      |

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option for bore code 11,11DS

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

<sup>4)</sup> Only available for  $d \geq 7,94$

## Loads and clearance

| Nominal<br>bore<br>code | Dash<br>number<br><br>multiples of<br>1/16 inch | Static limit loads <sup>6)</sup> |                                       | Standard clearances    |               | Reduced clearances    |              |
|-------------------------|-------------------------------------------------|----------------------------------|---------------------------------------|------------------------|---------------|-----------------------|--------------|
|                         |                                                 | Radial<br>C <sub>s</sub>         | Axial<br>C <sub>a</sub> <sup>5)</sup> | Radial                 | Axial<br>max  | Radial                | Axial<br>max |
| —                       |                                                 | lbf/kN                           |                                       | in/μm                  |               |                       |              |
| 4,83                    | 03                                              | 12 150<br>54                     | 5 175<br>23                           | 0.0004/0.0012<br>10/30 | 0.0047<br>120 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 6,35                    | 04                                              | 13 725<br>61                     | 5 850<br>26                           | 0.0004/0.0012<br>10/30 | 0.0047<br>120 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 7,94                    | 05                                              | 14 175<br>63                     | 5 400<br>24                           | 0.0004/0.0012<br>10/30 | 0.0047<br>120 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 9,52                    | 06                                              | 21 375<br>95                     | 8 325<br>37                           | 0.0004/0.0012<br>10/30 | 0.0047<br>120 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 11,11                   | 07                                              | 27 000<br>120                    | 10 575<br>47                          | 0.0004/0.0012<br>10/30 | 0.0047<br>120 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 11,11...DS              | 07A                                             | 27 000<br>120                    | 10 575<br>47                          | 0.0004/0.0012<br>10/30 | 0.0047<br>120 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 12,7                    | 08                                              | 35 550<br>158                    | 13 950<br>62                          | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0001/0.0004<br>2/10 | 0.0014<br>35 |
| 14,29                   | 09                                              | 43 875<br>195                    | 16 200<br>72                          | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0001/0.0005<br>3/12 | 0.0016<br>40 |

<sup>5)</sup> These values can be limited by the unstaking load (contact SKF for more information)

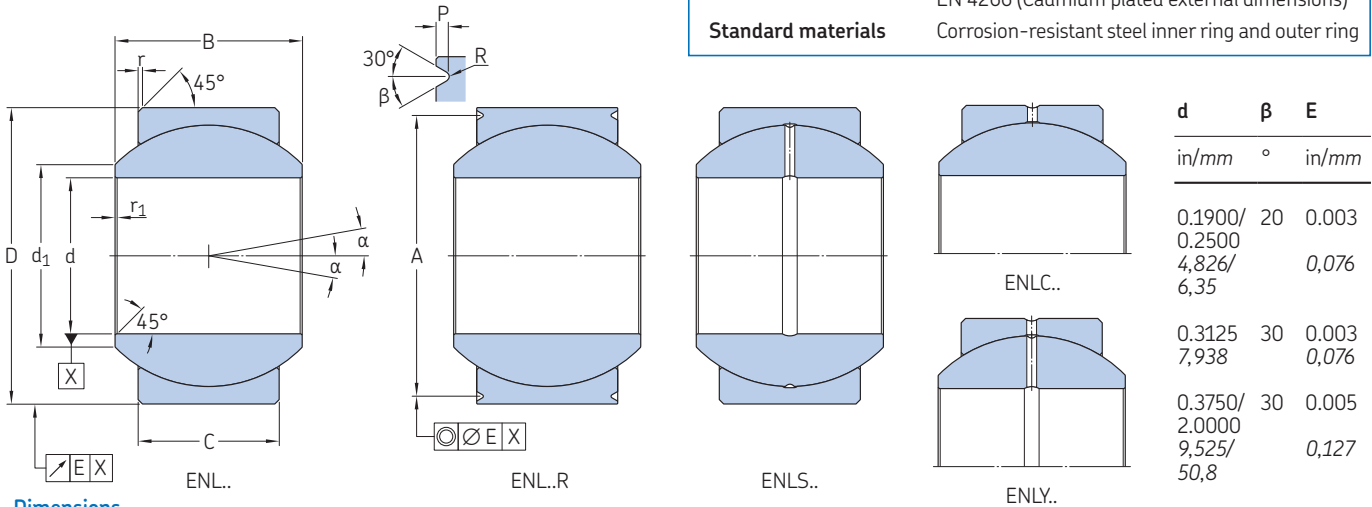
<sup>6)</sup> Loads are valid for the spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>7)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## 2.14 Metal-to-metal swaged wide (inch dimensions)

ENL.. bore code 15,87 to 50,8

|                                |                                                                      |
|--------------------------------|----------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2337                                                              |
| <b>Product standards</b>       | EN 4265 (Not plated)<br>EN 4266 (Cadmium plated external dimensions) |
| <b>Standard materials</b>      | Corrosion-resistant steel inner ring and outer ring                  |



Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d     | Δdmp                   | Δds                                | D                | ΔDmp                  | ΔDs                                | C<br>+0.005/0<br>+0,127/0 | B<br>0/-0.002<br>0/-0,051 |
|-------------------|------------------------------------|------------------|------------------------|------------------------------------|------------------|-----------------------|------------------------------------|---------------------------|---------------------------|
|                   |                                    | in/mm            |                        |                                    |                  |                       |                                    |                           |                           |
| 15,87             | 10                                 | 0.6250<br>15,875 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127             | 1.1875<br>30,163 | 0/-0.0004<br>0/-0,009 | 0/-0.0005<br>0/-0,0127             | 0.567<br>14,400           | 0.750<br>19,050           |
| 19,05             | 12                                 | 0.7500<br>19,050 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127             | 1.3750<br>34,925 | 0/-0.0004<br>0/-0,011 | 0/-0.0005<br>0/-0,0127             | 0.630<br>16,002           | 0.875<br>22,225           |
| 22,22             | 14                                 | 0.8750<br>22,225 | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127             | 1.6250<br>41,275 | 0/-0.0004<br>0/-0,011 | 0/-0.0005<br>0/-0,0127             | 0.755<br>19,177           | 0.875<br>22,225           |
| 25,4              | 16                                 | 1.0000<br>25,400 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 2.1250<br>53,975 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.005<br>25,527           | 1.375<br>34,925           |
| 31,75             | 20                                 | 1.2500<br>31,750 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 2.3750<br>60,325 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.130<br>28,702           | 1.500<br>38,100           |
| 38,10             | 24                                 | 1.5000<br>38,100 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 2.6875<br>68,260 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.223<br>31,064           | 1.687<br>42,850           |
| 44,45             | 28                                 | 1.7500<br>44,450 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 3.0000<br>76,200 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.317<br>33,452           | 1.812<br>46,020           |
| 50,8              | 32                                 | 2.0000<br>50,800 | 0/-0.0005<br>0/-0,0127 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 3.2500<br>82,550 | 0/-0.0005<br>0/-0,013 | +0.0001/-0.0006<br>+0,0025/-0,0152 | 1.380<br>35,050           | 1.937<br>49,190           |

Dimensions cont.

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d1  | r1<br>±0.005<br>±0,127 | r<br>+0.010/0<br>+0,254/0 | A<br>0/-0.008<br>0/-0,203 | P<br>0/-0.010<br>0/-0,250 | R                          | α <sup>7)</sup> | Mass<br>≈     |
|-------------------|------------------------------------|----------------|------------------------|---------------------------|---------------------------|---------------------------|----------------------------|-----------------|---------------|
|                   |                                    | in/mm          |                        |                           |                           |                           |                            | °               | lb/g          |
| 15,87             | 10                                 | 0.747<br>18,97 | 0.010<br>0,254         | 0.020<br>0,508            | 1.087<br>27,610           | 0.035<br>0,890            | 0.010/0.017<br>0.254/0.432 | 12              | 0.14<br>63    |
| 19,05             | 12                                 | 0.845<br>21,46 | 0.010<br>0,254         | 0.030<br>0,762            | 1.251<br>31,775           | 0.055<br>1,400            | 0.010/0.017<br>0.254/0.432 | 14              | 0.20<br>92    |
| 22,22             | 14                                 | 0.995<br>25,27 | 0.010<br>0,254         | 0.030<br>0,762            | 1.501<br>38,125           | 0.055<br>1,400            | 0.010/0.017<br>0.254/0.432 | 6               | 0.32<br>146   |
| 25,4              | 16                                 | 1.269<br>32,23 | 0.010<br>0,254         | 0.030<br>0,762            | 2.001<br>50,825           | 0.055<br>1,400            | 0.010/0.017<br>0.254/0.432 | 15              | 0.86<br>392   |
| 31,75             | 20                                 | 1.462<br>37,15 | 0.010<br>0,254         | 0.030<br>0,762            | 2.251<br>57,180           | 0.055<br>1,400            | 0.010/0.017<br>0.254/0.432 | 13              | 1.10<br>499   |
| 38,10             | 24                                 | 1.697<br>43,10 | 0.010<br>0,254         | 0.030<br>0,762            | 2.563<br>65,100           | 0.055<br>1,400            | 0.010/0.017<br>0.254/0.432 | 14              | 1.47<br>668   |
| 44,45             | 28                                 | 1.965<br>49,90 | 0.010<br>0,254         | 0.030<br>0,762            | 2.876<br>73,050           | 0.055<br>1,400            | 0.010/0.017<br>0.254/0.432 | 13              | 1.89<br>859   |
| 50,8              | 32                                 | 2.209<br>56,10 | 0.010<br>0,254         | 0.030<br>0,762            | 3.124<br>79,350           | 0.055<br>1,400            | 0.010/0.017<br>0.254/0.432 | 13              | 2.22<br>1 005 |

**Designation system**

|                                        |                                                                         |   |     |   |      |   |   |    |    |     |      |
|----------------------------------------|-------------------------------------------------------------------------|---|-----|---|------|---|---|----|----|-----|------|
| Examples:                              | ZENLS12,7RXTT-2CP6RP01                                                  | Z | ENL | S | 12,7 | R | X | TT | -2 | CP6 | RP01 |
|                                        | ENLC11,11RDSPPCP109                                                     |   |     |   |      |   |   |    |    |     |      |
| <b>Surface treatment of outer ring</b> |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Not plated                                                              |   |     |   |      |   |   |    |    |     |      |
| Z                                      | Cadmium plated external dimensions                                      |   |     |   |      |   |   |    |    |     |      |
| SZ <sup>1)</sup>                       | Zinc-nickel plated external dimensions                                  |   |     |   |      |   |   |    |    |     |      |
| <b>Basic designation</b>               |                                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Lubrication grooves</b>             |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Without lubrication groove                                              |   |     |   |      |   |   |    |    |     |      |
| S                                      | Lubrication by inner ring                                               |   |     |   |      |   |   |    |    |     |      |
| C <sup>3)</sup>                        | Lubrication by outer ring                                               |   |     |   |      |   |   |    |    |     |      |
| Y <sup>1)</sup>                        | Lubrication by inner and outer ring                                     |   |     |   |      |   |   |    |    |     |      |
| <b>Bore code</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| <b>Chamfer and groove</b>              |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code <sup>2)</sup>                  | Chamfered outer ring                                                    |   |     |   |      |   |   |    |    |     |      |
| R                                      | Grooved outer ring                                                      |   |     |   |      |   |   |    |    |     |      |
| <b>Clearances</b>                      |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Standard clearances                                                     |   |     |   |      |   |   |    |    |     |      |
| X                                      | Reduced clearances                                                      |   |     |   |      |   |   |    |    |     |      |
| <b>Shield and seal</b>                 |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | No shield and seal                                                      |   |     |   |      |   |   |    |    |     |      |
| TT <sup>1) 4)</sup>                    | Sealed                                                                  |   |     |   |      |   |   |    |    |     |      |
| PP <sup>1) 4)</sup>                    | shielded                                                                |   |     |   |      |   |   |    |    |     |      |
| <b>Lubricant</b>                       |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Grease G354                                                             |   |     |   |      |   |   |    |    |     |      |
| -2                                     | Grease G395                                                             |   |     |   |      |   |   |    |    |     |      |
| <b>Surface treatment of inner ring</b> |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Passivated inner ring                                                   |   |     |   |      |   |   |    |    |     |      |
| CP6 <sup>1)</sup>                      | Chromium plated sphere                                                  |   |     |   |      |   |   |    |    |     |      |
| CP109 <sup>1)</sup>                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |     |   |      |   |   |    |    |     |      |
| <b>Oversize</b>                        |                                                                         |   |     |   |      |   |   |    |    |     |      |
| No code                                | Standard outer diameter size                                            |   |     |   |      |   |   |    |    |     |      |
| RP01 <sup>1)</sup>                     | 0.010 in/0,254 mm oversized outer diameter                              |   |     |   |      |   |   |    |    |     |      |
| RP02 <sup>1)</sup>                     | 0.020 in/0,508 mm oversized outer diameter                              |   |     |   |      |   |   |    |    |     |      |

1) SKF option

2) SKF option for bore code 11,11DS

3) In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$ 4) Only available for  $d \geq 7,94$ **Loads and clearance**

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Static limit loads <sup>6)</sup> |                                       | Standard clearances    |               | Reduced clearances    |              |
|-------------------|---------------------------------------|----------------------------------|---------------------------------------|------------------------|---------------|-----------------------|--------------|
|                   |                                       | Radial<br>C <sub>s</sub>         | Axial<br>C <sub>a</sub> <sup>5)</sup> | Radial                 | Axial<br>max  | Radial                | Axial<br>max |
| –                 |                                       | lbf/kN                           |                                       | in/μm                  |               |                       |              |
| 15,87             | 10                                    | 49 500<br>220                    | 17 775<br>79                          | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0001/0.0005<br>3/12 | 0.0016<br>40 |
| 19,05             | 12                                    | 64 125<br>285                    | 20 925<br>93                          | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0015/0.0006<br>4/15 | 0.0020<br>50 |
| 22,22             | 14                                    | 83 250<br>370                    | 31 725<br>141                         | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0015/0.0006<br>4/15 | 0.0020<br>50 |
| 25,4              | 16                                    | 158 625<br>706                   | 59 625<br>265                         | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0015/0.0006<br>4/15 | 0.0020<br>50 |
| 31,75             | 20                                    | 200 250<br>891                   | 76 500<br>340                         | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0015/0.0006<br>4/15 | 0.0020<br>50 |
| 38,10             | 24                                    | 247 500<br>1 101                 | 92 250<br>410                         | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0015/0.0006<br>4/15 | 0.0020<br>50 |
| 44,45             | 28                                    | 299 250<br>1 331                 | 108 000<br>480                        | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0015/0.0006<br>4/15 | 0.0020<br>50 |
| 50,8              | 32                                    | 344 250<br>1 531                 | 117 000<br>520                        | 0.0004/0.0020<br>10/50 | 0.0090<br>229 | 0.0002/0.0008<br>5/20 | 0.0024<br>60 |

5) These values can be limited by the unstaking load (contact SKF for more information)

6) Loads are valid for the spherical plain bearings without lubrication groove. For other bearings, refer to page 134

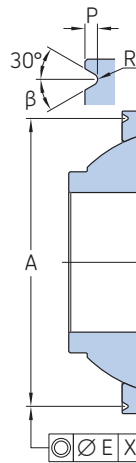
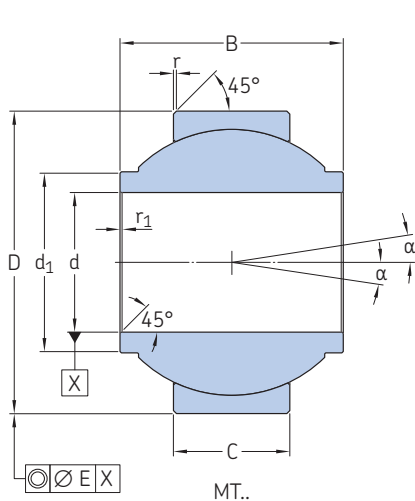
7) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## 2.15 Metal-to-metal swaged high misalignment (inch dimensions)

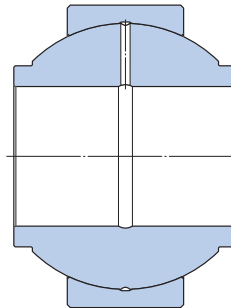
MT.. bore code 4,83 to 12,7

Technical specification –  
Product standards –

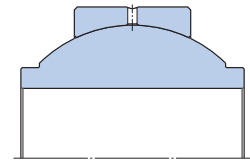
| d                             | β  | E              |
|-------------------------------|----|----------------|
| in/mm                         | °  | in/mm          |
| 0.1900/0.4375<br>4,826/11,113 | 20 | 0.005<br>0,127 |
| 0.5000/1.2500<br>12,7/31,75   | 30 | 0.005<br>0,127 |



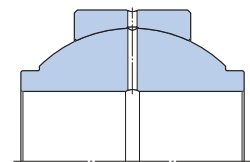
MT..R



MTS..



MTC..



MTY..

### Dimensions

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d        | D                      | C                | B                    | d <sub>1</sub>  | r <sub>1</sub>         | r                     | A                    | P                    |
|-------------------|------------------------------------------|------------------------|------------------------|------------------|----------------------|-----------------|------------------------|-----------------------|----------------------|----------------------|
|                   |                                          | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | ±0.010<br>±0,254 | 0/-0.005<br>0/-0,127 | ≈               | +0.012/-0<br>+0,230/-0 | +0.015/0<br>+0,381/-0 | +0.010/0<br>+0,254/0 | 0/-0.254<br>0/-0,010 |
| in/mm             |                                          |                        |                        |                  |                      |                 |                        |                       |                      |                      |
| 4,83              | 03                                       | 0.1900<br>4,826        | 0.5625<br>14,288       | 0.205<br>5,207   | 0.500<br>12,700      | 0.315<br>8,000  | 0.004<br>0,100         | 0.020<br>0,508        | 0.502<br>12,751      | 0.030<br>0,762       |
| 6,35              | 04                                       | 0.2500<br>6,350        | 0.7400<br>18,796       | 0.250<br>6,350   | 0.593<br>15,062      | 0.386<br>9,800  | 0.004<br>0,100         | 0.020<br>0,508        | 0.669<br>17,000      | 0.030<br>0,762       |
| 7,94              | 05                                       | 0.3125<br>7,938        | 0.9060<br>23,012       | 0.340<br>8,636   | 0.813<br>20,650      | 0.512<br>13,000 | 0.004<br>0,100         | 0.020<br>0,508        | 0.831<br>21,100      | 0.030<br>0,762       |
| 9,52              | 06                                       | 0.3750<br>9,525        | 0.9060<br>23,012       | 0.340<br>8,636   | 0.813<br>20,650      | 0.532<br>13,500 | 0.004<br>0,100         | 0.020<br>0,508        | 0.831<br>21,100      | 0.030<br>0,762       |
| 11,11             | 07                                       | 0.4375<br>11,113       | 1.0000<br>25,400       | 0.340<br>8,636   | 0.875<br>22,225      | 0.620<br>15,750 | 0.004<br>0,100         | 0.020<br>0,508        | 0.925<br>23,500      | 0.030<br>0,762       |
| 12,7              | 08                                       | 0.5000<br>12,700       | 1.1250<br>28,575       | 0.396<br>10,058  | 0.937<br>23,799      | 0.728<br>18,480 | 0.004<br>0,100         | 0.020<br>0,508        | 1.047<br>26,600      | 0.030<br>0,762       |

### Dimensions cont., loads and clearance

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>R            | α <sup>3)</sup> | Mass<br>≈  | Static limit loads <sup>2)</sup><br>Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>1)</sup> | Axial clearance<br>Reduced | Standard                |
|-------------------|------------------------------------------|----------------------------|-----------------|------------|--------------------------------------------------------------|---------------------------------------|----------------------------|-------------------------|
|                   |                                          | in/mm                      | °               | lb/g       | lbf/kN                                                       |                                       | in/μm                      |                         |
| 4,83              | 03                                       | 0.005/0.010<br>0.127/0.254 | 15              | 0.02<br>9  | 3 642<br>16,2                                                | 899<br>4,0                            | 0.0002/0.0020<br>5/50      | 0.0020/0.0040<br>50/100 |
| 6,35              | 04                                       | 0.005/0.010<br>0.127/0.254 | 24              | 0.04<br>18 | 6 924<br>30,8                                                | 517<br>2,3                            | 0.0002/0.0020<br>5/50      | 0.0020/0.0040<br>50/100 |
| 7,94              | 05                                       | 0.005/0.010<br>0.127/0.254 | 23              | 0.07<br>32 | 12 544<br>55,8                                               | 1 304<br>5,8                          | 0.0002/0.0020<br>5/50      | 0.0020/0.0040<br>50/100 |
| 9,52              | 06                                       | 0.005/0.010<br>0.127/0.254 | 22              | 0.07<br>32 | 12 544<br>55,8                                               | 1 304<br>5,8                          | 0.0002/0.0020<br>5/50      | 0.0020/0.0040<br>50/100 |
| 11,11             | 07                                       | 0.005/0.010<br>0.127/0.254 | 22              | 0.10<br>45 | 13 286<br>59,1                                               | 1 394<br>6,2                          | 0.0002/0.0020<br>5/50      | 0.0020/0.0040<br>50/100 |
| 12,7              | 08                                       | 0.005/0.010<br>0.127/0.254 | 20              | 0.16<br>73 | 18 906<br>84,1                                               | 2 360<br>10,5                         | 0.0002/0.0020<br>5/50      | 0.0020/0.0040<br>50/100 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140



## Designation system

Examples: ZWQMTS12,7RXTT-2CP6RP01      Z    WQ    MT    S    12,7    R    X    TT    -2    CP6    RP01  
 QMT25,4PPCP109

### Surface treatment of outer ring

**No code** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

**Material code**    **Inner ring material**    **External ring material**  
**W** Corrosion-resistant steel    Corrosion-resistant steel  
**Q** Bronze beryllium    Corrosion-resistant steel  
**WQ** Corrosion-resistant steel    Bronze aluminium

### Basic designation

#### Lubrication grooves

**No code** Without lubrication groove  
**S** Lubrication by inner ring  
**C<sup>3)</sup>** Lubrication by outer ring  
**Y** Lubrication by inner and outer ring

#### Bore code

#### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

#### Axial clearance

**No code** Standard axial clearance  
**X** Reduced axial clearance

#### Shield and seal

**No code** No shield and seal  
**TT<sup>4)</sup>** Sealed  
**PP<sup>4)</sup>** Shielded

#### Lubricant

**No code** Grease G354  
**-2** Grease G395

#### Surface treatment of inner ring

**No code** Not plated  
**CP6<sup>2)</sup>** Chromium plated sphere  
**CP109<sup>2)</sup>** XCR plating on sphere (chromium 6 free replacement to chromium plating)  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel inner ring

#### Oversize

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

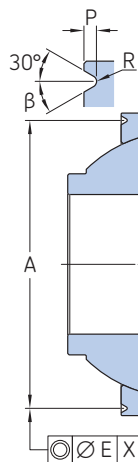
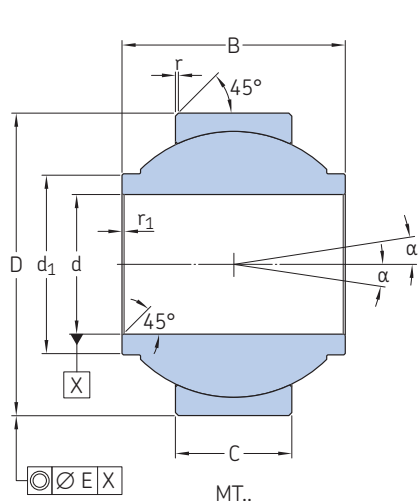
<sup>4)</sup> Only available for  $d \geq 7,94$

## 2.15 Metal-to-metal swaged high misalignment (inch dimensions)

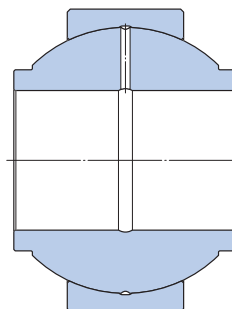
MT.. bore code 15,87 to 31,75

Technical specification –  
Product standards –

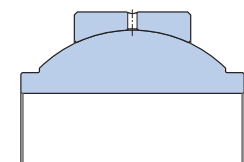
| d                             | β  | E              |
|-------------------------------|----|----------------|
| in/mm                         | °  | in/mm          |
| 0.1900/0.4375<br>4,826/11,113 | 20 | 0.005<br>0,127 |
| 0.5000/1.2500<br>12,7/31,75   | 30 | 0.005<br>0,127 |



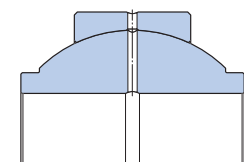
MT..R



MTS..



MTC..



MTY..

### Dimensions

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d        | D                      | C                | B                    | d <sub>1</sub>  | r <sub>1</sub>         | r                     | A                    | P                    |
|-------------------|------------------------------------------|------------------------|------------------------|------------------|----------------------|-----------------|------------------------|-----------------------|----------------------|----------------------|
|                   |                                          | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | ±0.010<br>±0,254 | 0/-0.005<br>0/-0,127 | ≈               | +0.012/-0<br>+0,230/-0 | +0.015/0<br>+0,381/-0 | +0.010/0<br>+0,254/0 | 0/-0.254<br>0/-0,010 |
| in/mm             |                                          |                        |                        |                  |                      |                 |                        |                       |                      |                      |
| 15,87             | 10                                       | 0.6250<br>15,875       | 1.3750<br>34,925       | 0.562<br>14,275  | 1.200<br>30,480      | 0.857<br>21,770 | 0.004<br>0,100         | 0.020<br>0,508        | 1.268<br>32,200      | 0.040<br>1,016       |
| 19,05             | 12                                       | 0.7500<br>19,050       | 1.5625<br>39,688       | 0.615<br>15,621  | 1.280<br>32,512      | 0.963<br>24,450 | 0.004<br>0,100         | 0.020<br>0,508        | 1.437<br>36,500      | 0.060<br>1,524       |
| 22,22             | 14                                       | 0.8750<br>22,225       | 1.7500<br>44,450       | 0.620<br>15,748  | 1.400<br>35,560      | 1.122<br>28,490 | 0.004<br>0,100         | 0.020<br>0,508        | 1.624<br>41,250      | 0.060<br>1,524       |
| 25,4              | 16                                       | 1.0000<br>25,400       | 2.1250<br>53,975       | 0.830<br>21,082  | 1.875<br>47,625      | 1.272<br>32,320 | 0.004<br>0,100         | 0.020<br>0,508        | 2.003<br>50,876      | 0.060<br>1,524       |
| 31,75             | 20                                       | 1.2500<br>31,750       | 2.5000<br>63,500       | 1.000<br>25,400  | 1.875<br>47,625      | 1.523<br>38,700 | 0.004<br>0,100         | 0.020<br>0,508        | 2.370<br>60,200      | 0.060<br>1,524       |

### Dimensions cont., loads and clearance

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>R            | α <sup>3)</sup> | Mass<br>≈   | Static limit loads <sup>2)</sup><br>Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>1)</sup> | Axial clearance<br>Reduced | Standard                |
|-------------------|------------------------------------------|----------------------------|-----------------|-------------|--------------------------------------------------------------|---------------------------------------|----------------------------|-------------------------|
|                   |                                          | in/mm                      | °               | lb/g        | lbf/kN                                                       |                                       | in/μm                      |                         |
| 15,87             | 10                                       | 0.010/0.020<br>0,254/0,508 | 20              | 0.25<br>114 | 34 080<br>151,6                                              | 5 553<br>24,7                         | 0.0002/0.0020<br>5/50      | 0.0020/0.0040<br>50/100 |
| 19,05             | 12                                       | 0.010/0.020<br>0,254/0,508 | 19              | 0.32<br>145 | 51 457<br>228,9                                              | 6 362<br>28,3                         | 0.0002/0.0020<br>5/50      | 0.0020/0.0040<br>50/100 |
| 22,22             | 14                                       | 0.010/0.020<br>0,254/0,508 | 19              | 0.43<br>195 | 61 708<br>274,5                                              | 6 452<br>28,7                         | 0.0002/0.0024<br>5/60      | 0.0024/0.0047<br>60/120 |
| 25,4              | 16                                       | 0.010/0.020<br>0,254/0,508 | 21              | 0.81<br>367 | 84 053<br>373,9                                              | 12 206<br>54,3                        | 0.0002/0.0024<br>5/60      | 0.0024/0.0047<br>60/120 |
| 31,75             | 20                                       | 0.010/0.020<br>0,254/0,508 | 21              | 1.11<br>504 | 119 301<br>530,7                                             | 19 355<br>86,1                        | 0.0002/0.0024<br>5/60      | 0.0024/0.0047<br>60/120 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>3)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## Designation system

Examples: ZWQMTS12,7RXTT-2CP6RP01 Z WQ MT S 12,7 R X TT -2 CP6 RP01  
 QMT25,4PPCP109

### Surface treatment of outer ring

**No code** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

**Material code** **Inner ring material** **External ring material**  
**W** Corrosion-resistant steel Corrosion-resistant steel  
**Q** Bronze beryllium Corrosion-resistant steel  
**WQ** Corrosion-resistant steel Bronze aluminium

### Basic designation

#### Lubrication grooves

**No code** Without lubrication groove  
**S** Lubrication by inner ring  
**C<sup>3)</sup>** Lubrication by outer ring  
**Y** Lubrication by inner and outer ring

#### Bore code

#### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

#### Axial clearance

**No code** Standard axial clearance  
**X** Reduced axial clearance

#### Shield and seal

**No code** No shield and seal  
**TT<sup>4)</sup>** Sealed  
**PP<sup>4)</sup>** Shielded

#### Lubricant

**No code** Grease G354  
**-2** Grease G395

#### Surface treatment of inner ring

**No code** Not plated  
**CP6<sup>2)</sup>** Chromium plated sphere  
**CP109<sup>2)</sup>** XCR plating on sphere (chromium 6 free replacement to chromium plating)  
**CP55<sup>2)</sup>** Passivated corrosion-resistant steel inner ring

#### Oversize

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>2)</sup> Available only for inner ring in corrosion-resistant steel material

<sup>3)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

<sup>4)</sup> Only available for  $d \geq 7,94$

## 2.16 Metal-to-metal swaged (inch dimensions)

QXMB.. bore code 6,35 to 19,05

**Technical specification** AS 81936

**Product standards**

AS 81936/1 (Grooved outer ring)

AS 81936/2 (Chamfered outer ring)

**Materials**

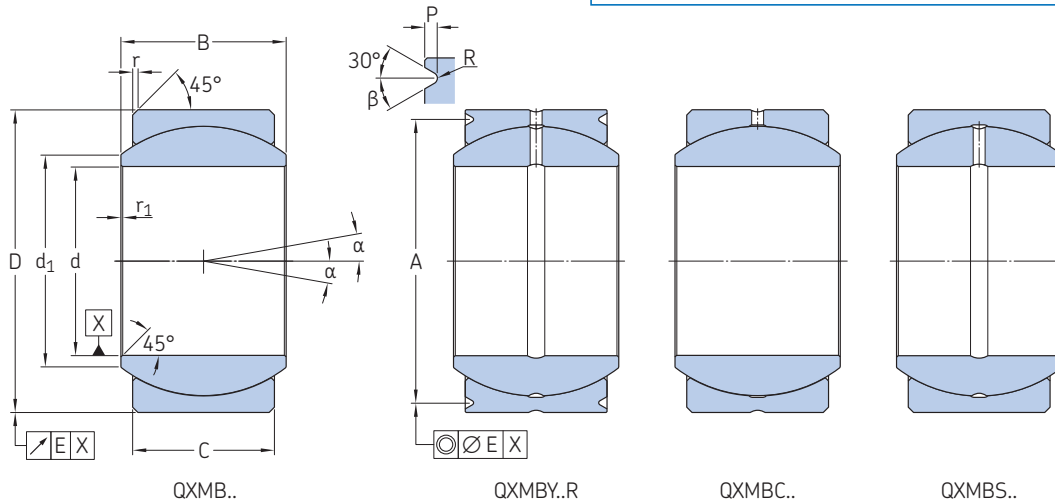
Inner ring: Bronze beryllium

External ring: Corrosion-resistant steel

**Lubricant**

Grease G395

| d                   | β  | E              |
|---------------------|----|----------------|
| in/mm               | °  | in/mm          |
| 0.2500<br>6,35      | 20 | 0.005<br>0,127 |
| ≥ 0.3125<br>≥ 7,938 | 30 | 0.005<br>0,127 |



### Dimensions

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d | D      | C      | B      | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0,010/-0<br>+0,254/-0 | r<br>+0,030/-0<br>+0,762/-0 | A<br>+0/-0,010<br>+0/-0,254 | P<br>0/-0,015<br>0/-0,380 |
|-------------------|------------------------------------------|-----------------|--------|--------|--------|---------------------|------------------------------------------|-----------------------------|-----------------------------|---------------------------|
|                   |                                          | in/mm           |        |        |        |                     |                                          |                             |                             |                           |
| 6,35              | 04                                       | 0.2500          | 0.6562 | 0.250  | 0.343  | 0.357               | 0.005                                    | 0.010                       | 0.596                       | 0.030                     |
|                   |                                          | 6,350           | 16,667 | 6,350  | 8,712  | 9,068               | 0,127                                    | 0,254                       | 15,138                      | 0,762                     |
| 7,94              | 05                                       | 0.3125          | 0.7500 | 0.281  | 0.375  | 0.413               | 0.005                                    | 0.010                       | 0.652                       | 0.040                     |
|                   |                                          | 7,938           | 19,050 | 7,137  | 9,525  | 10,490              | 0,127                                    | 0,254                       | 16,561                      | 1,016                     |
| 9,52              | 06                                       | 0.3750          | 0.8125 | 0.312  | 0.406  | 0.509               | 0.005                                    | 0.010                       | 0.714                       | 0.040                     |
|                   |                                          | 9,525           | 20,638 | 7,925  | 10,312 | 12,923              | 0,127                                    | 0,254                       | 18,136                      | 1,016                     |
| 11,11             | 07                                       | 0.4375          | 0.9062 | 0.343  | 0.437  | 0.563               | 0.005                                    | 0.010                       | 0.808                       | 0.040                     |
|                   |                                          | 11,113          | 23,017 | 8,712  | 11,100 | 14,300              | 0,127                                    | 0,254                       | 20,523                      | 1,016                     |
| 12,7              | 08                                       | 0.5000          | 1.0000 | 0.390  | 0.500  | 0.634               | 0.005                                    | 0.010                       | 0.878                       | 0.060                     |
|                   |                                          | 12,700          | 25,400 | 9,906  | 12,700 | 16,104              | 0,127                                    | 0,254                       | 22,301                      | 1,524                     |
| 14,29             | 09                                       | 0.5625          | 1.0937 | 0.437  | 0.562  | 0.664               | 0.005                                    | 0.010                       | 0.972                       | 0.060                     |
|                   |                                          | 14,288          | 27,780 | 11,100 | 14,275 | 16,866              | 0,127                                    | 0,254                       | 24,689                      | 1,524                     |
| 15,87             | 10                                       | 0.6250          | 1.1875 | 0.500  | 0.625  | 0.732               | 0.005                                    | 0.010                       | 1.065                       | 0.060                     |
|                   |                                          | 15,875          | 30,163 | 12,700 | 15,875 | 18,593              | 0,127                                    | 0,254                       | 27,051                      | 1,524                     |
| 19,05             | 12                                       | 0.7500          | 1.4375 | 0.593  | 0.750  | 0.913               | 0.005                                    | 0.010                       | 1.315                       | 0.060                     |
|                   |                                          | 19,050          | 36,513 | 15,062 | 19,050 | 23,190              | 0,127                                    | 0,254                       | 33,401                      | 1,524                     |



## Designation system

Examples: ZQXMB12,7RTTRP01  
QXMB25,4PP

Z QXMB C 12,7 R TT RP01

### Surface treatment of outer ring

**No code** Not plated  
**Z**<sup>1)</sup> Cadmium plated external dimensions  
**SZ**<sup>1)</sup> Zinc-nickel plated external dimensions

### Basic designation

#### Lubrication grooves

**No code**<sup>1)</sup> Without lubrication groove  
**S**<sup>1)</sup> Lubrication by inner ring  
**C**<sup>2)</sup> Lubrication by outer ring  
**Y** Lubrication by inner and outer ring

#### Bore code

#### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

#### Shield and seal

**No code** No shield and seal  
**TT**<sup>1), 3)</sup> Sealed  
**PP**<sup>1), 3)</sup> Shielded

#### Oversize

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

<sup>3)</sup> Only available for  $d \geq 7,94$

## Dimensions cont., loads and clearance

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions R               | $\alpha^{(4)}$ | Mass $\approx$ | Static limit loads |                            | Dynamic loads         |                        | Clearances max |              |
|-------------------|------------------------------------|----------------------------|----------------|----------------|--------------------|----------------------------|-----------------------|------------------------|----------------|--------------|
|                   |                                    |                            |                |                | Radial $C_s$       | Axial <sup>(1)</sup> $C_a$ | Mode I <sup>(2)</sup> | Mode II <sup>(3)</sup> | Radial         | Axial        |
| –                 |                                    | in/mm                      | °              | lb/g           | lbf/kN             |                            |                       |                        | in/ $\mu$ m    |              |
| <b>6,35</b>       | <b>04</b>                          | 0.005/0.010<br>0,127/0,254 | 12             | 0.03<br>14     | 6 330<br>28,16     | 1 930<br>8,59              | 2 570<br>11,43        | 5 000<br>22,24         | 0.001<br>25    | 0.005<br>127 |
| <b>7,94</b>       | <b>05</b>                          | 0.010/0.020<br>0,127/0,254 | 11             | 0.04<br>18     | 8 460<br>37,63     | 2 450<br>10,90             | 3 520<br>15,66        | 6 300<br>28,02         | 0.001<br>25    | 0.005<br>127 |
| <b>9,52</b>       | <b>06</b>                          | 0.010/0.020<br>0,254/0,508 | 9              | 0.05<br>22     | 11 400<br>50,71    | 3 090<br>13,75             | 4 570<br>20,33        | 8 200<br>36,48         | 0.001<br>25    | 0.005<br>127 |
| <b>11,11</b>      | <b>07</b>                          | 0.010/0.020<br>0,254/0,508 | 8              | 0.06<br>27     | 14 800<br>65,83    | 3 740<br>16,64             | 5 750<br>25,58        | 9 900<br>44,04         | 0.001<br>25    | 0.005<br>127 |
| <b>12,7</b>       | <b>08</b>                          | 0.010/0.020<br>0,254/0,508 | 8              | 0.08<br>36     | 20 400<br>90,74    | 4 860<br>21,62             | 7 500<br>33,36        | 12 650<br>56,27        | 0.001<br>25    | 0.005<br>127 |
| <b>14,29</b>      | <b>09</b>                          | 0.010/0.020<br>0,254/0,508 | 8              | 0.11<br>50     | 26 700<br>118,77   | 6 100<br>27,13             | 9 500<br>42,26        | 15 300<br>68,06        | 0.001<br>25    | 0.005<br>127 |
| <b>15,87</b>      | <b>10</b>                          | 0.010/0.020<br>0,254/0,508 | 8              | 0.14<br>64     | 33 100<br>147,24   | 8 080<br>35,94             | 11 750<br>52,27       | 19 300<br>85,85        | 0.001<br>25    | 0.005<br>127 |
| <b>19,05</b>      | <b>12</b>                          | 0.010/0.020<br>0,254/0,508 | 8              | 0.24<br>109    | 50 000<br>222,41   | 11 440<br>50,89            | 16 900<br>75,17       | 28 200<br>125,44       | 0.001<br>25    | 0.005<br>127 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Load fixed with respect to the outer ring

<sup>3)</sup> Load fixed with respect to the inner ring

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## 2.16 Metal-to-metal swaged (inch dimensions)

QXMB.. bore code 20,64 to 38,10

Technical specification AS 81936

### Product standards

AS 81936/1 (Grooved outer ring)

AS 81936/2 (Chamfered outer ring)

### Materials

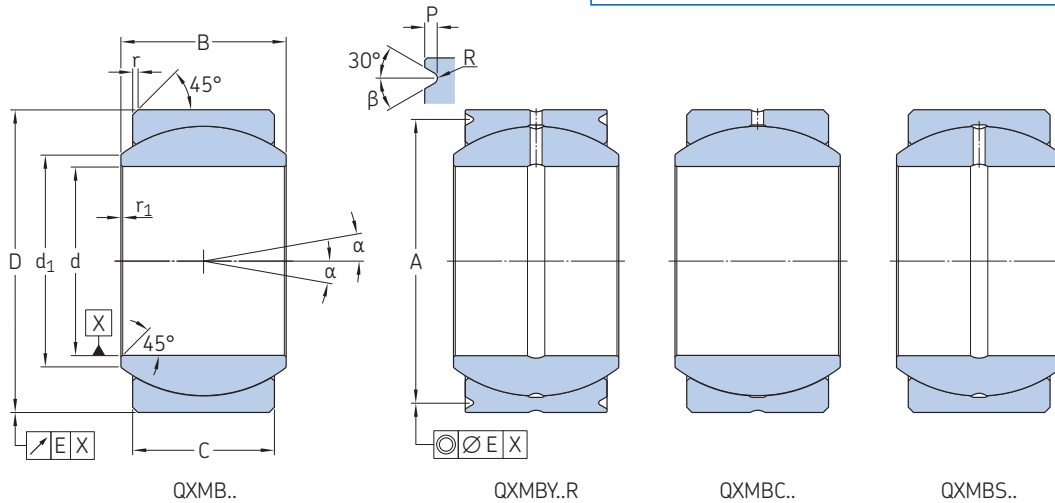
Inner ring: Bronze beryllium

External ring: Corrosion-resistant steel

### Lubricant

Grease G395

| d                   | β  | E              |
|---------------------|----|----------------|
| in/mm               | °  | in/mm          |
| 0.2500<br>6,35      | 20 | 0.005<br>0,127 |
| ≥ 0.3125<br>≥ 7,938 | 30 | 0.005<br>0,127 |



## Dimensions

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d  | D                | C               | B               | d <sub>1</sub><br>≈ | r <sub>1</sub><br>+0.010/-0<br>+0.254/-0 | r<br>+0.030/-0<br>+0.762/-0 | A<br>+0/-0.010<br>+0/-0.254 | P<br>0/-0.015<br>0/-0.380 |
|-------------------|------------------------------------------|------------------|------------------|-----------------|-----------------|---------------------|------------------------------------------|-----------------------------|-----------------------------|---------------------------|
| in/mm             |                                          |                  |                  |                 |                 |                     |                                          |                             |                             |                           |
| 20,64             | 13                                       | 0.8125<br>20,638 | 1.5625<br>39,688 | 0.650<br>16,510 | 0.812<br>20,625 | 0.984<br>24,994     | 0.005<br>0,127                           | 0.010<br>0,254              | 1.440<br>36,576             | 0.060<br>1,524            |
| 22,22             | 14                                       | 0.8750<br>22,225 | 1.6562<br>42,067 | 0.703<br>17,856 | 0.875<br>22,225 | 1.054<br>26,772     | 0.005<br>0,127                           | 0.010<br>0,254              | 1.534<br>38,964             | 0.060<br>1,524            |
| 25,4              | 16                                       | 1.0000<br>25,400 | 1.8750<br>47,625 | 0.797<br>20,244 | 1.000<br>25,400 | 1.193<br>30,302     | 0.005<br>0,127                           | 0.010<br>0,254              | 1.753<br>44,653             | 0.060<br>1,524            |
| 28,57             | 18                                       | 1.1250<br>28,575 | 2.1250<br>53,975 | 0.900<br>22,860 | 1.125<br>28,575 | 1.334<br>33,884     | 0.005<br>0,127                           | 0.010<br>0,254              | 2.003<br>50,876             | 0.060<br>1,524            |
| 31,75             | 20                                       | 1.2500<br>31,750 | 2.3125<br>58,737 | 1.000<br>25,400 | 1.250<br>31,750 | 1.473<br>37,414     | 0.005<br>0,127                           | 0.010<br>0,254              | 2.190<br>55,626             | 0.060<br>1,524            |
| 34,92             | 22                                       | 1.3750<br>34,925 | 2.5625<br>65,088 | 1.100<br>27,940 | 1.375<br>34,925 | 1.654<br>42,012     | 0.005<br>0,127                           | 0.010<br>0,254              | 2.440<br>61,976             | 0.060<br>1,524            |
| 38,10             | 24                                       | 1.5000<br>38,100 | 2.8125<br>71,437 | 1.200<br>30,480 | 1.500<br>38,100 | 1.794<br>45,568     | 0.005<br>0,127                           | 0.010<br>0,254              | 2.690<br>68,326             | 0.060<br>1,524            |

## Designation system

Examples: ZQXMB12,7RTTRP01  
QXMB25,4PP

### Surface treatment of outer ring

**No code** Not plated  
**Z**<sup>1)</sup> Cadmium plated external dimensions  
**SZ**<sup>1)</sup> Zinc-nickel plated external dimensions

### Basic designation

### Lubrication grooves

**No code**<sup>1)</sup> Without lubrication groove  
**S**<sup>1)</sup> Lubrication by inner ring  
**C**<sup>2)</sup> Lubrication by outer ring  
**Y** Lubrication by inner and outer ring

### Bore code

### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

### Shield and seal

**No code** No shield and seal  
**TT**<sup>1), 3)</sup> Sealed  
**PP**<sup>1), 3)</sup> Shielded

### Over-size

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

<sup>3)</sup> Only available for  $d \geq 7,94$

## Dimensions cont., loads and clearance

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions                 |                        | Mass ≈      | Static limit loads    |                                    | Dynamic loads        |                       | Clearances max |              |
|-------------------|------------------------------------|----------------------------|------------------------|-------------|-----------------------|------------------------------------|----------------------|-----------------------|----------------|--------------|
|                   |                                    | R                          | $\alpha$ <sup>4)</sup> |             | Radial C <sub>s</sub> | Axial <sup>1)</sup> C <sub>a</sub> | Mode I <sup>2)</sup> | Mode II <sup>3)</sup> | Radial         | Axial        |
| –                 |                                    | in/mm                      | °                      | lb/g        | lbf/kN                |                                    |                      |                       | in/μm          |              |
| <b>20,64</b>      | <b>13</b>                          | 0.010/0.020<br>0,254/0,508 | 8                      | 0.28<br>127 | 59 000<br>262,45      | 13 800<br>61,39                    | 19 800<br>88,07      | 33 400<br>148,57      | 0.001<br>25    | 0.005<br>127 |
| <b>22,22</b>      | <b>14</b>                          | 0.010/0.020<br>0,254/0,508 | 8                      | 0.37<br>168 | 70 300<br>312,71      | 16 160<br>71,88                    | 23 000<br>102,31     | 38 700<br>172,15      | 0.001<br>25    | 0.005<br>127 |
| <b>25,4</b>       | <b>16</b>                          | 0.010/0.020<br>0,254/0,508 | 8                      | 0.53<br>240 | 77 700<br>345,63      | 20 850<br>92,75                    | 30 000<br>133,45     | 49 800<br>221,52      | 0.001<br>25    | 0.005<br>127 |
| <b>28,57</b>      | <b>18</b>                          | 0.010/0.020<br>0,254/0,508 | 8                      | 0.71<br>321 | 121 500<br>540,46     | 26 740<br>118,95                   | 38 000<br>169,03     | 63 000<br>280,24      | 0.001<br>25    | 0.005<br>127 |
| <b>31,75</b>      | <b>20</b>                          | 0.010/0.020<br>0,254/0,508 | 8                      | 1.00<br>454 | 152 000<br>676,13     | 33 065<br>147,08                   | 46 900<br>208,62     | 77 500<br>344,74      | 0.001<br>25    | 0.005<br>127 |
| <b>34,92</b>      | <b>22</b>                          | 0.010/0.020<br>0,254/0,508 | 8                      | 1.26<br>570 | 186 000<br>827,37     | 40 120<br>178,46                   | 56 900<br>253,10     | 95 000<br>422,58      | 0.001<br>25    | 0.005<br>127 |
| <b>38,10</b>      | <b>24</b>                          | 0.010/0.020<br>0,254/0,508 | 8                      | 1.79<br>812 | 224 000<br>996,40     | 47 820<br>212,71                   | 67 500<br>300,25     | 112 500<br>500,42     | 0.001<br>25    | 0.005<br>127 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Load fixed with respect to the outer ring

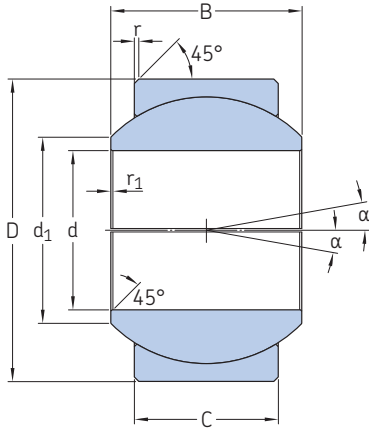
<sup>3)</sup> Load fixed with respect to the inner ring

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140

## 2.17 Metal-to-metal split (inch dimensions)

2PL.. bore code **4,83** to **15,87**

Technical specification –  
Product standards –



2PL..

2PLS..

2PLC..

2PLY..

### Dimensions

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d<br>0/-0,0005<br>0/-0,0127 | D<br>0/-0,0005<br>0/-0,0127 | C<br>±0,005<br>±0,127 | B<br>0/-0,002<br>0/-0,051 | d <sub>1</sub><br>≈ | r <sub>1</sub><br>±0,005<br>±0,127 | r<br>+0,010/0<br>+0,254/0 | α <sup>2)</sup> |
|-------------------|------------------------------------------|-------------------------------------------|-----------------------------|-----------------------|---------------------------|---------------------|------------------------------------|---------------------------|-----------------|
| –                 |                                          | in/mm                                     |                             |                       |                           |                     |                                    |                           | °               |
| <b>4,83</b>       | <b>03</b>                                | 0.1900<br>4,826                           | 0.6250<br>15,875            | 0.327<br>8,306        | 0.437<br>11,100           | 0.300<br>7,620      | 0.010<br>0,254                     | 0.015<br>0,381            | 15              |
| <b>6,35</b>       | <b>04</b>                                | 0.2500<br>6,350                           | 0.6250<br>15,875            | 0.327<br>8,306        | 0.437<br>11,100           | 0.300<br>7,620      | 0.010<br>0,254                     | 0.015<br>0,381            | 15              |
| <b>7,94</b>       | <b>05</b>                                | 0.3125<br>7,938                           | 0.6875<br>17,462            | 0.317<br>8,052        | 0.437<br>11,100           | 0.360<br>9,140      | 0.010<br>0,254                     | 0.015<br>0,381            | 14              |
| <b>9,52</b>       | <b>06</b>                                | 0.3750<br>9,525                           | 0.8125<br>20,638            | 0.406<br>10,312       | 0.500<br>12,700           | 0.466<br>11,840     | 0.010<br>0,254                     | 0.020<br>0,508            | 8               |
| <b>11,11</b>      | <b>07</b>                                | 0.4375<br>11,113                          | 0.9375<br>23,812            | 0.442<br>11,227       | 0.562<br>14,275           | 0.537<br>13,640     | 0.010<br>0,254                     | 0.020<br>0,508            | 10              |
| <b>12,7</b>       | <b>08</b>                                | 0.5000<br>12,700                          | 1.0000<br>25,400            | 0.505<br>12,827       | 0.625<br>15,875           | 0.607<br>15,420     | 0.010<br>0,254                     | 0.020<br>0,508            | 9               |
| <b>14,29</b>      | <b>09</b>                                | 0.5625<br>14,288                          | 1.1250<br>28,575            | 0.536<br>13,614       | 0.687<br>17,450           | 0.721<br>18,310     | 0.010<br>0,254                     | 0.020<br>0,508            | 10              |
| <b>15,87</b>      | <b>10</b>                                | 0.6250<br>15,875                          | 1.1875<br>30,163            | 0.567<br>14,400       | 0.750<br>19,050           | 0.747<br>18,970     | 0.010<br>0,254                     | 0.020<br>0,508            | 12              |

### Loads and clearance

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Mass<br>≈   | Static limit loads <sup>1)</sup> |                         | Clearance<br>Radial    |
|-------------------|------------------------------------------|-------------|----------------------------------|-------------------------|------------------------|
|                   |                                          |             | Radial<br>C <sub>s</sub>         | Axial<br>C <sub>a</sub> |                        |
| –                 |                                          | lb/g        | lbf/kN                           |                         | in/μm                  |
| <b>4,83</b>       | <b>03</b>                                | 0.03<br>14  | 12 150<br>54                     | 5 175<br>23             | 0.0004/0.0008<br>10/20 |
| <b>6,35</b>       | <b>04</b>                                | 0.03<br>14  | 13 725<br>61                     | 5 850<br>26             | 0.0004/0.0008<br>10/20 |
| <b>7,94</b>       | <b>05</b>                                | 0.035<br>16 | 14 175<br>63                     | 5 400<br>24             | 0.0004/0.0008<br>10/20 |
| <b>9,52</b>       | <b>06</b>                                | 0.06<br>27  | 21 375<br>95                     | 8 325<br>37             | 0.0004/0.0008<br>10/20 |
| <b>11,11</b>      | <b>07</b>                                | 0.08<br>38  | 27 000<br>120                    | 10 575<br>47            | 0.0004/0.0008<br>10/20 |
| <b>12,7</b>       | <b>08</b>                                | 0.10<br>45  | 35 550<br>158                    | 13 950<br>62            | 0.0004/0.0008<br>10/20 |
| <b>14,29</b>      | <b>09</b>                                | 0.14<br>61  | 43 875<br>195                    | 16 200<br>72            | 0.0004/0.0012<br>10/30 |
| <b>15,87</b>      | <b>10</b>                                | 0.16<br>73  | 49 500<br>220                    | 17 775<br>79            | 0.0004/0.0012<br>10/30 |

<sup>1)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>2)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140





## Designation system

|                                        |                                                                         |   |   |     |   |      |    |    |     |      |
|----------------------------------------|-------------------------------------------------------------------------|---|---|-----|---|------|----|----|-----|------|
| Examples:                              | ZW2PLS12,7TT-2CP6RP01                                                   | Z | W | 2PL | S | 12,7 | TT | -2 | CP6 | RP01 |
|                                        | Q2PLC25,4PPCP109                                                        |   |   |     |   |      |    |    |     |      |
| <b>Surface treatment of outer ring</b> |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Not plated                                                              |   |   |     |   |      |    |    |     |      |
| <b>Z</b>                               | Cadmium plated external dimensions                                      |   |   |     |   |      |    |    |     |      |
| <b>SZ</b>                              | Zinc-nickel plated external dimensions                                  |   |   |     |   |      |    |    |     |      |
| <b>Material code</b>                   |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>Inner ring material</b>             |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>W</b>                               | Corrosion-resistant steel                                               |   |   |     |   |      |    |    |     |      |
| <b>Q</b>                               | Bronze beryllium                                                        |   |   |     |   |      |    |    |     |      |
| <b>WQ</b>                              | Corrosion-resistant steel                                               |   |   |     |   |      |    |    |     |      |
| <b>External ring material</b>          |                                                                         |   |   |     |   |      |    |    |     |      |
|                                        | Corrosion-resistant steel                                               |   |   |     |   |      |    |    |     |      |
|                                        | Corrosion-resistant steel                                               |   |   |     |   |      |    |    |     |      |
|                                        | Bronze aluminium                                                        |   |   |     |   |      |    |    |     |      |
| <b>Basic designation</b>               |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>Lubrication grooves</b>             |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Without lubrication groove                                              |   |   |     |   |      |    |    |     |      |
| <b>S</b>                               | Lubrication by inner ring                                               |   |   |     |   |      |    |    |     |      |
| <b>C<sup>2)</sup></b>                  | Lubrication by outer ring                                               |   |   |     |   |      |    |    |     |      |
| <b>Y</b>                               | Lubrication by inner and outer ring                                     |   |   |     |   |      |    |    |     |      |
| <b>Bore code</b>                       |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>Shield and seal</b>                 |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | No shield and seal                                                      |   |   |     |   |      |    |    |     |      |
| <b>TT<sup>3)</sup></b>                 | Sealed                                                                  |   |   |     |   |      |    |    |     |      |
| <b>PP<sup>3)</sup></b>                 | Shielded                                                                |   |   |     |   |      |    |    |     |      |
| <b>Lubricant</b>                       |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Grease G354                                                             |   |   |     |   |      |    |    |     |      |
| <b>-2</b>                              | Grease G395                                                             |   |   |     |   |      |    |    |     |      |
| <b>Surface treatment of inner ring</b> |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Not plated                                                              |   |   |     |   |      |    |    |     |      |
| <b>CP6<sup>1)</sup></b>                | Chromium plated sphere                                                  |   |   |     |   |      |    |    |     |      |
| <b>CP109<sup>1)</sup></b>              | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |   |      |    |    |     |      |
| <b>CP55<sup>1)</sup></b>               | Passivated corrosion-resistant steel inner ring                         |   |   |     |   |      |    |    |     |      |
| <b>Oversize</b>                        |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Standard outer diameter size                                            |   |   |     |   |      |    |    |     |      |
| <b>RP01</b>                            | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |   |      |    |    |     |      |
| <b>RP02</b>                            | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |   |      |    |    |     |      |

1) Available only for inner ring in corrosion-resistant steel material

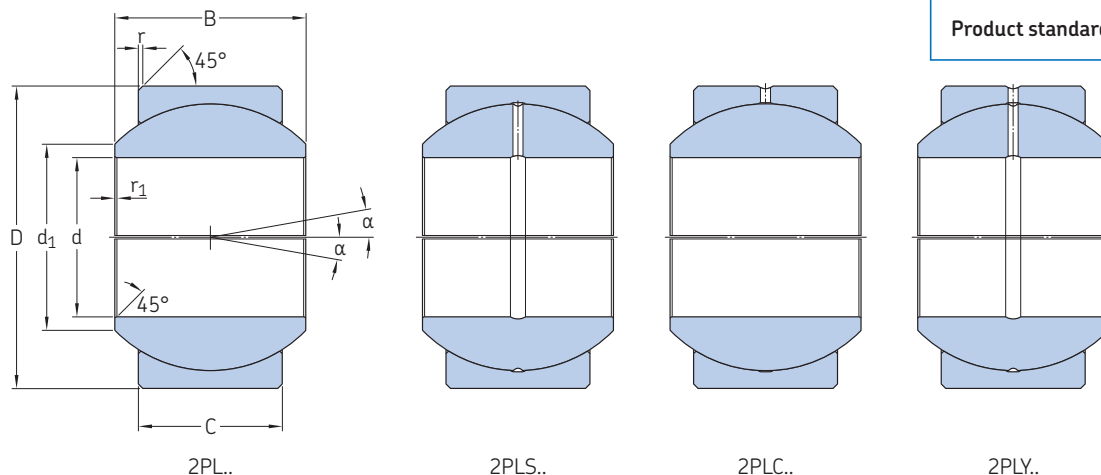
2) In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

3) Only available for  $d \geq 7,94$

## 2.17 Metal-to-metal split (inch dimensions)

2PL.. bore code **19,05** to **50,80**

Technical specification –  
Product standards –



### Dimensions

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d<br>0/-0,0005<br>0/-0,0127 | D<br>0/-0,0005<br>0/-0,0127 | C<br>±0,005<br>±0,127 | B<br>0/-0,002<br>0/-0,051 | d <sub>1</sub><br>≈ | r <sub>1</sub><br>±0,005<br>±0,127 | r<br>+0,010/0<br>+0,254/0 | α <sup>2)</sup> |
|-------------------|------------------------------------------|-------------------------------------------|-----------------------------|-----------------------|---------------------------|---------------------|------------------------------------|---------------------------|-----------------|
| –                 |                                          | in/mm                                     |                             |                       |                           |                     |                                    |                           | °               |
| <b>19,05</b>      | <b>12</b>                                | 0.7500<br>19,050                          | 1.3750<br>34,925            | 0.630<br>16,002       | 0.875<br>22,225           | 0.845<br>21,460     | 0.010<br>0,254                     | 0.030<br>0,762            | 13              |
| <b>22,22</b>      | <b>14</b>                                | 0.8750<br>22,225                          | 1.6250<br>41,275            | 0.755<br>19,177       | 0.875<br>22,225           | 0.995<br>25,270     | 0.010<br>0,254                     | 0.030<br>0,762            | 6               |
| <b>25,4</b>       | <b>16</b>                                | 1.0000<br>25,400                          | 2.1250<br>53,975            | 1.005<br>25,527       | 1.375<br>34,925           | 1.269<br>32,230     | 0.010<br>0,254                     | 0.030<br>0,762            | 12              |
| <b>31,75</b>      | <b>20</b>                                | 1.2500<br>31,750                          | 2.3750<br>60,325            | 1.130<br>28,702       | 1.500<br>38,100           | 1.462<br>37,150     | 0.010<br>0,254                     | 0.030<br>0,762            | 12              |
| <b>38,10</b>      | <b>24</b>                                | 1.5000<br>38,100                          | 2.6875<br>68,260            | 1.223<br>31,064       | 1.687<br>42,850           | 1.697<br>43,100     | 0.010<br>0,254                     | 0.030<br>0,762            | 13              |
| <b>44,45</b>      | <b>28</b>                                | 1.7500<br>44,450                          | 3.0000<br>76,200            | 1.317<br>33,452       | 1.812<br>46,020           | 1.965<br>49,900     | 0.010<br>0,254                     | 0.030<br>0,762            | 12              |
| <b>50,80</b>      | <b>32</b>                                | 2.0000<br>50,800                          | 3.2500<br>82,550            | 1.380<br>35,050       | 1.937<br>49,190           | 2.209<br>56,100     | 0.010<br>0,254                     | 0.030<br>0,762            | 12              |

### Loads and clearance

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Mass<br>≈     | Static limit loads <sup>1)</sup><br>Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | Clearance<br>Radial    |
|-------------------|------------------------------------------|---------------|--------------------------------------------------------------|-------------------------|------------------------|
| –                 |                                          | lb/g          | lbf/kN                                                       |                         | in/μm                  |
| <b>19,05</b>      | <b>12</b>                                | 0.24<br>109   | 64 125<br>285                                                | 20 925<br>93            | 0.0004/0.0012<br>10/30 |
| <b>22,22</b>      | <b>14</b>                                | 0.35<br>159   | 83 250<br>370                                                | 31 725<br>141           | 0.0004/0.0012<br>10/30 |
| <b>25,4</b>       | <b>16</b>                                | 0.97<br>440   | 158 625<br>706                                               | 59 625<br>265           | 0.0004/0.0016<br>10/40 |
| <b>31,75</b>      | <b>20</b>                                | 1.10<br>500   | 200 250<br>891                                               | 76 500<br>340           | 0.0004/0.0016<br>10/40 |
| <b>38,10</b>      | <b>24</b>                                | 1.54<br>700   | 247 500<br>1 101                                             | 92 250<br>410           | 0.0004/0.0016<br>10/40 |
| <b>44,45</b>      | <b>28</b>                                | 1.99<br>900   | 299 250<br>1 331                                             | 108 000<br>480          | 0.0004/0.0016<br>10/40 |
| <b>50,80</b>      | <b>32</b>                                | 2.31<br>1 050 | 344 250<br>1 531                                             | 117 000<br>520          | 0.0004/0.0016<br>10/40 |

<sup>1)</sup> Loads are valid for the steel/steel spherical plain bearings without lubrication groove. For other bearings, refer to page 134

<sup>2)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 140



## Designation system

|                                        |                                                                         |   |   |     |   |      |    |    |     |      |
|----------------------------------------|-------------------------------------------------------------------------|---|---|-----|---|------|----|----|-----|------|
| Examples:                              | ZW2PLS12,7TT-2CP6RP01                                                   | Z | W | 2PL | S | 12,7 | TT | -2 | CP6 | RP01 |
|                                        | Q2PLC25,4PPCP109                                                        |   |   |     |   |      |    |    |     |      |
| <b>Surface treatment of outer ring</b> |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Not plated                                                              |   |   |     |   |      |    |    |     |      |
| <b>Z</b>                               | Cadmium plated external dimensions                                      |   |   |     |   |      |    |    |     |      |
| <b>SZ</b>                              | Zinc-nickel plated external dimensions                                  |   |   |     |   |      |    |    |     |      |
| <b>Material code</b>                   |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>Inner ring material</b>             |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>W</b>                               | Corrosion-resistant steel                                               |   |   |     |   |      |    |    |     |      |
| <b>Q</b>                               | Bronze beryllium                                                        |   |   |     |   |      |    |    |     |      |
| <b>WQ</b>                              | Corrosion-resistant steel                                               |   |   |     |   |      |    |    |     |      |
| <b>External ring material</b>          |                                                                         |   |   |     |   |      |    |    |     |      |
|                                        | Corrosion-resistant steel                                               |   |   |     |   |      |    |    |     |      |
|                                        | Corrosion-resistant steel                                               |   |   |     |   |      |    |    |     |      |
|                                        | Bronze aluminium                                                        |   |   |     |   |      |    |    |     |      |
| <b>Basic designation</b>               |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>Lubrication grooves</b>             |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Without lubrication groove                                              |   |   |     |   |      |    |    |     |      |
| <b>S</b>                               | Lubrication by inner ring                                               |   |   |     |   |      |    |    |     |      |
| <b>C<sup>2)</sup></b>                  | Lubrication by outer ring                                               |   |   |     |   |      |    |    |     |      |
| <b>Y</b>                               | Lubrication by inner and outer ring                                     |   |   |     |   |      |    |    |     |      |
| <b>Bore code</b>                       |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>Shield and seal</b>                 |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | No shield and seal                                                      |   |   |     |   |      |    |    |     |      |
| <b>TT<sup>3)</sup></b>                 | Sealed                                                                  |   |   |     |   |      |    |    |     |      |
| <b>PP<sup>3)</sup></b>                 | Shielded                                                                |   |   |     |   |      |    |    |     |      |
| <b>Lubricant</b>                       |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Grease G354                                                             |   |   |     |   |      |    |    |     |      |
| <b>-2</b>                              | Grease G395                                                             |   |   |     |   |      |    |    |     |      |
| <b>Surface treatment of inner ring</b> |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Not plated                                                              |   |   |     |   |      |    |    |     |      |
| <b>CP6<sup>1)</sup></b>                | Chromium plated sphere                                                  |   |   |     |   |      |    |    |     |      |
| <b>CP109<sup>1)</sup></b>              | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |   |      |    |    |     |      |
| <b>CP55<sup>1)</sup></b>               | Passivated corrosion-resistant steel inner ring                         |   |   |     |   |      |    |    |     |      |
| <b>Oversize</b>                        |                                                                         |   |   |     |   |      |    |    |     |      |
| <b>No code</b>                         | Standard outer diameter size                                            |   |   |     |   |      |    |    |     |      |
| <b>RP01</b>                            | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |   |      |    |    |     |      |
| <b>RP02</b>                            | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |   |      |    |    |     |      |

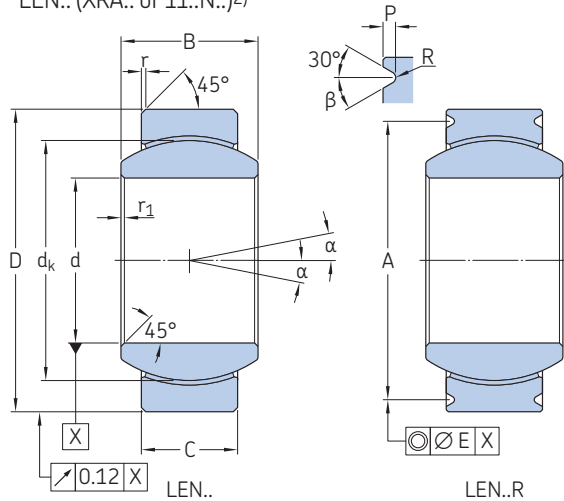
1) Available only for inner ring in corrosion-resistant steel material

2) In the outer ring sphere, central lubrication groove only for  $d \leq 7,94$

3) Only available for  $d \geq 7,94$

## 2.18 Self-lubricating light (metric dimensions)

LEN.. (XRA.. or 11..N..)²



|                                |                                                                         |
|--------------------------------|-------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2755                                                                 |
| <b>Product standards</b>       | EN 3048 (standard starting torque)<br>EN 4037 (reduced starting torque) |
| <b>Materials</b>               |                                                                         |
| Liner                          | X1                                                                      |
| Inner ring                     | Corrosion-resistant steel 440C                                          |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                        |

| $\beta$ | E    |
|---------|------|
| °       | mm   |
| 30      | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d<br>Bore without liner | $\Delta d_{mp}$ | $\Delta d_s$ | $d_a$<br>= d with lined bore H7 | D   | $\Delta D_{mp}$ | $\Delta D_s$ | C<br>$\pm 0,1$ | B<br>0/-0,06 | $d_k$<br>≈ |
|-------------------|------------------------------------|-----------------|--------------|---------------------------------|-----|-----------------|--------------|----------------|--------------|------------|
| –                 | mm                                 | $\mu m$         |              | mm                              |     | $\mu m$         |              | mm             |              |            |
| 12                | 12                                 | 0/-8            | +3/-11       | 12                              | 22  | 0/-9            | +6/-15       | 7              | 10           | 17,4       |
| 15/26             | 15                                 | 0/-8            | +3/-11       | 15                              | 26  | 0/-9            | +6/-15       | 9              | 12           | 22,2       |
| 15 <sup>1)</sup>  | 15                                 | 0/-8            | +3/-11       | 15                              | 28  | 0/-9            | +6/-15       | 9              | 12           | 22,2       |
| 17/30             | 17                                 | 0/-8            | +3/-11       | 17                              | 30  | 0/-9            | +6/-15       | 10             | 14           | 25,4       |
| 17 <sup>1)</sup>  | 17                                 | 0/-8            | +3/-11       | 17                              | 32  | 0/-9            | +6/-15       | 10             | 14           | 25,4       |
| 20                | 20                                 | 0/-10           | +3/-13       | 20                              | 35  | 0/-11           | +8/-19       | 12             | 16           | 29,6       |
| 25                | 25                                 | 0/-10           | +3/-13       | 25                              | 42  | 0/-11           | +8/-19       | 16             | 20           | 36,1       |
| 30                | 30                                 | 0/-10           | +3/-13       | 30                              | 47  | 0/-11           | +8/-19       | 18             | 22           | 40,7       |
| 35                | 35                                 | 0/-12           | +3/-15       | 35                              | 55  | 0/-13           | +10/-23      | 20             | 25           | 47,6       |
| 40                | 40                                 | 0/-12           | +3/-15       | 40                              | 62  | 0/-13           | +10/-23      | 22             | 28           | 53,0       |
| 45                | 45                                 | 0/-12           | +3/-15       | 45                              | 68  | 0/-13           | +10/-23      | 25             | 32           | 60,5       |
| 50                | 50                                 | 0/-12           | +3/-15       | 50                              | 75  | 0/-13           | +10/-23      | 28             | 35           | 67,9       |
| 60 <sup>1)</sup>  | 60                                 | 0/-12           | +3/-15       | 60                              | 90  | 0/-13           | +10/-23      | 36             | 44           | 80,0       |
| 70 <sup>1)</sup>  | 70                                 | 0/-12           | +3/-15       | 70                              | 105 | 0/-13           | +10/-23      | 40             | 49           | 91,9       |

### Dimensions cont., loads and torque

| Nominal<br>bore<br>code | Dimensions               |         | A<br>+0,1/0<br>Code R | P<br>0/−0,2<br>Code PR | R<br>+0,1/0 | α <sup>4)</sup> | Mass<br>≈ | Static limit loads       |                                       | Radial dynamic<br>load<br>C25 | Starting torque <sup>4)</sup> |          |            |
|-------------------------|--------------------------|---------|-----------------------|------------------------|-------------|-----------------|-----------|--------------------------|---------------------------------------|-------------------------------|-------------------------------|----------|------------|
|                         | r <sub>1</sub><br>+0,3/0 | r       |                       |                        |             |                 |           | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>3)</sup> |                               | Standard                      | Reduced  |            |
| –                       | mm                       |         |                       |                        |             | °               | g         | kN                       |                                       |                               | Nm                            |          |            |
| 12                      | 0,1                      | 0,5/0,8 | 20,2                  | –                      | 0,7         | 0,2             | 11        | 17                       | 46,4                                  | 3,7                           | 25,5                          | 0,12/0,8 | 0,008/0,1  |
| 15/26                   | 0,1                      | 0,5/0,8 | 24,2                  | 24                     | 0,7         | 0,2             | 9         | 30                       | 79,5                                  | 8                             | 43,7                          | 0,12/0,8 | 0,01/0,12  |
| 15 <sup>1)</sup>        | 0,1                      | 0,5/0,8 | 26,2                  | –                      | 0,7         | 0,2             | 9         | 32                       | 79,5                                  | 8                             | 43,7                          | 0,12/0,8 | 0,01/0,12  |
| 17/30                   | 0,1                      | 0,5/0,8 | 28,2                  | 28                     | 0,7         | 0,2             | 10        | 40                       | 102,6                                 | 10,6                          | 56,4                          | 0,12/0,8 | 0,01/0,12  |
| 17 <sup>1)</sup>        | 0,1                      | 0,5/0,8 | 30,2                  | –                      | 0,7         | 0,2             | 10        | 49                       | 102,6                                 | 10,6                          | 56,4                          | 0,12/0,8 | 0,01/0,12  |
| 20                      | 0,1                      | 0,6/1   | 33,2                  | 33                     | 0,7         | 0,2             | 9         | 65                       | 147,4                                 | 17                            | 81                            | 0,12/0,8 | 0,01/0,12  |
| 25                      | 0,1                      | 0,6/1   | 39,4                  | 38,8                   | 0,9         | 0,3             | 7         | 115                      | 221,7                                 | 28,7                          | 110,8                         | 0,25/1   | 0,015/0,25 |
| 30                      | 0,1                      | 0,6/1   | 44,4                  | 43,8                   | 0,9         | 0,3             | 6         | 160                      | 285,6                                 | 38,2                          | 142,8                         | 0,4/2    | 0,02/0,4   |
| 35                      | 0,1                      | 0,8/1,2 | 51,8                  | –                      | 1,4         | 0,3             | 7         | 229                      | 374,5                                 | 48,7                          | 187,3                         | 0,4/2    | 0,02/0,4   |
| 40                      | 0,1                      | 0,8/1,2 | 58,8                  | –                      | 1,4         | 0,3             | 7         | 315                      | 462,7                                 | 60,7                          | 231,3                         | 0,6/2,7  | 0,025/0,5  |
| 45                      | 0,1                      | 0,8/1,2 | 64,8                  | –                      | 1,4         | 0,3             | 7         | 460                      | 605,8                                 | 81,6                          | 302,9                         | 0,6/2,7  | 0,03/0,6   |
| 50                      | 0,1                      | 0,8/1,2 | 71,8                  | –                      | 1,4         | 0,3             | 7         | 560                      | 770                                   | 105,6                         | 384                           | 0,6/2,7  | 0,03/0,6   |
| 60 <sup>1)</sup>        | 0,1                      | 0,8/1,2 | 86,8                  | –                      | 1,4         | 0,3             | 6         | 1 100                    | 1 056                                 | 156,7                         | 549,1                         | 0,6/2,7  | 0,03/0,6   |
| 70 <sup>1)</sup>        | 0,1                      | 0,8/1,2 | 101,8                 | –                      | 1,4         | 0,3             | 6         | 1 540                    | 1 361,6                               | 197,3                         | 708                           | 0,6/2,7  | 0,03/0,6   |

1) SKF option 2) Parts are delivered and marked with XRA.., 11C..N.. (not plated) or 11F..N.. (chromium plated sphere) standard references

3) These values can be limited by the unstaking load (contact SKF for more information)

4) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



### Cross-reference designation system to XRA.. or 11..N..

| Examples:                              | Z | LEN | 17 | A | R | X | TT | F | R10 |
|----------------------------------------|---|-----|----|---|---|---|----|---|-----|
| ZLEN17ARXTTFR10                        |   |     |    |   |   |   |    |   |     |
| LEN15/26PPD                            |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of outer ring</b> |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>Z<sup>1)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>SZ<sup>1)</sup></b>                 |   |     |    |   |   |   |    |   |     |
| <b>Basic designation</b>               |   |     |    |   |   |   |    |   |     |
| <b>Bore code</b>                       |   |     |    |   |   |   |    |   |     |
| <b>Lined bore</b>                      |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>A<sup>1)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>Chamfer and groove</b>              |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>R and PR<sup>2)</sup></b>           |   |     |    |   |   |   |    |   |     |
| <b>Starting torque</b>                 |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>X</b>                               |   |     |    |   |   |   |    |   |     |
| <b>Shield and seal</b>                 |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>TT<sup>1)</sup></b>                 |   |     |    |   |   |   |    |   |     |
| <b>PP<sup>1)</sup></b>                 |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of inner ring</b> |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>F</b>                               |   |     |    |   |   |   |    |   |     |
| <b>D<sup>1)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>V</b>                               |   |     |    |   |   |   |    |   |     |
| <b>K<sup>1)</sup> 3)</b>               |   |     |    |   |   |   |    |   |     |
| <b>N<sup>1)</sup> 3)</b>               |   |     |    |   |   |   |    |   |     |
| <b>H<sup>1)</sup> 3)</b>               |   |     |    |   |   |   |    |   |     |
| <b>Oversize</b>                        |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>R10<sup>1)</sup></b>                |   |     |    |   |   |   |    |   |     |
| <b>R20<sup>1)</sup></b>                |   |     |    |   |   |   |    |   |     |

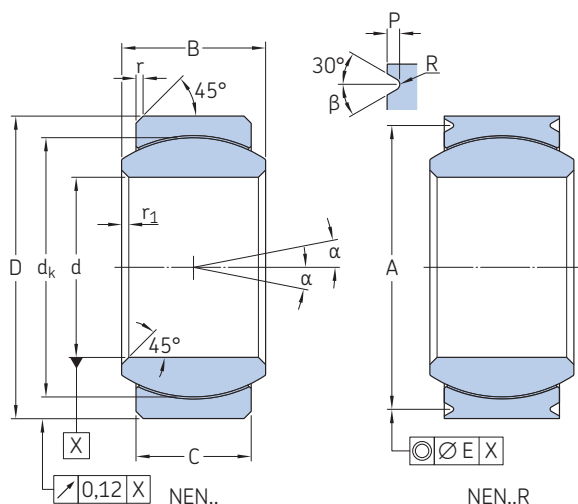
<sup>1)</sup> SKF option

<sup>2)</sup> Available only for bore codes 15/26, 17/30, 20, 25 and 30

<sup>3)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

## 2.19 Self-lubricating narrow (metric dimensions)

NEN.. (XRE..., 11..W., 11..N.. or 11..E..)¹ bore code **05** to **25**



|                                |                                                                         |
|--------------------------------|-------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2755                                                                 |
| <b>Product standards</b>       | EN 2584 (standard starting torque)<br>EN 4038 (reduced starting torque) |
| <b>Materials</b>               |                                                                         |
| Liner                          | X1                                                                      |
| Inner ring                     | Corrosion-resistant steel 440C                                          |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                        |

| d    | β  | E    |
|------|----|------|
| mm   | °  | mm   |
| ≤ 8  | 20 | 0,08 |
| ≥ 10 | 30 | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d<br>Bore without liner | Δdmp  | Δds    | d <sub>a</sub><br>= d with lined bore H7 | D  | ΔDmp  | ΔDs    | C<br>±0,1 | B<br>0/-0,06 | d <sub>k</sub><br>≈ |
|-------------------|------------------------------------|-------|--------|------------------------------------------|----|-------|--------|-----------|--------------|---------------------|
| –                 | mm                                 | μm    |        | mm                                       |    | μm    |        | mm        |              |                     |
| <b>05</b>         | 5                                  | 0/-8  | +2/-10 | 5                                        | 14 | 0/-8  | +5/-13 | 5,5       | 7            | 11,1                |
| <b>06</b>         | 6                                  | 0/-8  | +2/-10 | 6                                        | 16 | 0/-8  | +5/-13 | 6,5       | 9            | 12,7                |
| <b>08</b>         | 8                                  | 0/-8  | +2/-10 | 8                                        | 18 | 0/-8  | +5/-13 | 7         | 10           | 14,3                |
| <b>10</b>         | 10                                 | 0/-8  | +2/-10 | 10                                       | 21 | 0/-9  | +6/-15 | 8         | 10,5         | 15,9                |
| <b>12</b>         | 12                                 | 0/-8  | +3/-11 | 12                                       | 25 | 0/-9  | +6/-15 | 10        | 13           | 19,8                |
| <b>15</b>         | 15                                 | 0/-8  | +3/-11 | 15                                       | 29 | 0/-9  | +6/-15 | 12        | 15           | 25,4                |
| <b>17</b>         | 17                                 | 0/-8  | +3/-11 | 17                                       | 31 | 0/-9  | +6/-15 | 13,5      | 16           | 27,0                |
| <b>22</b>         | 22                                 | 0/-10 | +3/-13 | 22                                       | 40 | 0/-11 | +8/-19 | 18        | 22           | 34,9                |
| <b>25</b>         | 25                                 | 0/-10 | +3/-13 | 25                                       | 45 | 0/-11 | +8/-19 | 20        | 25           | 38,7                |

### Dimensions cont., loads and torque

| Nominal bore code | Dimensions r <sub>1</sub><br>+0,3/0 | r       | A<br>+0,1/0 | P<br>0/-0,2 | R<br>+0,1/0 | α³) | Mass<br>≈ | Static limit loads<br>Radial C <sub>s</sub> | Axial C <sub>a</sub> ²) | Radial dynamic load<br>C <sub>25</sub> | Starting torque³) | Standard   | Reduced |
|-------------------|-------------------------------------|---------|-------------|-------------|-------------|-----|-----------|---------------------------------------------|-------------------------|----------------------------------------|-------------------|------------|---------|
| –                 | mm                                  |         |             |             |             | °   | g         | kN                                          |                         |                                        | Nm                |            |         |
| <b>05</b>         | 0,1                                 | 0,5/0,8 | 12,2        | 0,7         | 0,2         | 9   | 7         | 20,5                                        | 1,9                     | 12,3                                   | 0,08/0,5          | 0,005/0,06 |         |
| <b>06</b>         | 0,1                                 | 0,5/0,8 | 14,2        | 0,7         | 0,2         | 14  | 9         | 29,2                                        | 3,5                     | 17,5                                   | 0,08/0,5          | 0,005/0,06 |         |
| <b>08</b>         | 0,1                                 | 0,5/0,8 | 16,2        | 0,7         | 0,2         | 15  | 12        | 37,0                                        | 3,9                     | 22,2                                   | 0,08/0,5          | 0,005/0,06 |         |
| <b>10</b>         | 0,1                                 | 0,5/0,8 | 18,4        | 0,9         | 0,3         | 11  | 20        | 47,2                                        | 6,5                     | 28,3                                   | 0,12/0,8          | 0,008/0,10 |         |
| <b>12</b>         | 0,1                                 | 0,5/0,8 | 22,4        | 0,9         | 0,3         | 10  | 32        | 78,1                                        | 11,7                    | 43,0                                   | 0,12/0,8          | 0,008/0,10 |         |
| <b>15</b>         | 0,1                                 | 0,5/0,8 | 26,4        | 0,9         | 0,3         | 8   | 50        | 121,9                                       | 18,0                    | 67,0                                   | 0,12/0,8          | 0,008/0,10 |         |
| <b>17</b>         | 0,1                                 | 0,5/0,8 | 28,4        | 0,9         | 0,3         | 7   | 59        | 148,3                                       | 24,3                    | 81,0                                   | 0,12/0,8          | 0,008/0,10 |         |
| <b>22</b>         | 0,1                                 | 0,6/1   | 36,8        | 1,4         | 0,3         | 8   | 126       | 268,6                                       | 45,5                    | 147,7                                  | 0,25/1,0          | 0,015/0,25 |         |
| <b>25</b>         | 0,1                                 | 0,6/1   | 41,8        | 1,4         | 0,3         | 8   | 185       | 324,7                                       | 55,9                    | 162,4                                  | 0,25/1,0          | 0,015/0,25 |         |

¹) Parts are delivered and marked with the following standard references: XRE..., 11C..W.. (Not plated) or 11F..W.. (Chromium plated sphere) for bore codes 5 and 22, 11C..N.. (Not plated) or 11F..N.. (Chromium plated sphere) for bore code 6 and 10, 11C..E.. (Not plated) or 11F..E.. (Chromium plated sphere) for bore code 8 and ≥ 12 (except 22)

²) These values can be limited by the unstaking load (contact SKF for more information)

³) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



### Cross-reference designation system to XRE..., 11..W..., 11..N.. or 11..E..

|                                        |                                                                         |   |     |    |   |   |   |    |   |     |
|----------------------------------------|-------------------------------------------------------------------------|---|-----|----|---|---|---|----|---|-----|
| Examples:                              | ZNEN17ARXTTFR10                                                         | Z | NEN | 17 | A | R | X | TT | F | R10 |
|                                        | NEN06PPD                                                                |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of outer ring</b> |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Not plated                                                              |   |     |    |   |   |   |    |   |     |
| <b>Z<sup>1)</sup></b>                  | Cadmium plated external dimensions                                      |   |     |    |   |   |   |    |   |     |
| <b>SZ<sup>1)</sup></b>                 | Zinc-nickel plated external dimensions                                  |   |     |    |   |   |   |    |   |     |
| <b>Basic designation</b>               |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>Bore code</b>                       |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>Lined bore</b>                      |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Bore without liner                                                      |   |     |    |   |   |   |    |   |     |
| <b>A<sup>1) 2)</sup></b>               | Lined bore                                                              |   |     |    |   |   |   |    |   |     |
| <b>Chamfer and groove</b>              |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Chamfered outer ring                                                    |   |     |    |   |   |   |    |   |     |
| <b>R</b>                               | Grooved outer ring                                                      |   |     |    |   |   |   |    |   |     |
| <b>Starting torque</b>                 |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Standard                                                                |   |     |    |   |   |   |    |   |     |
| <b>X</b>                               | Reduced                                                                 |   |     |    |   |   |   |    |   |     |
| <b>Shield and seal</b>                 |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | No shield and seal                                                      |   |     |    |   |   |   |    |   |     |
| <b>TT<sup>1) 2)</sup></b>              | Sealed                                                                  |   |     |    |   |   |   |    |   |     |
| <b>PP<sup>1) 2)</sup></b>              | Shielded                                                                |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of inner ring</b> |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Not plated                                                              |   |     |    |   |   |   |    |   |     |
| <b>F</b>                               | Chromium plated sphere                                                  |   |     |    |   |   |   |    |   |     |
| <b>D<sup>1)</sup></b>                  | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |     |    |   |   |   |    |   |     |
| <b>V</b>                               | Passivated inner ring                                                   |   |     |    |   |   |   |    |   |     |
| <b>K<sup>1) 3)</sup></b>               | XLHP coated sphere                                                      |   |     |    |   |   |   |    |   |     |
| <b>N<sup>1) 3)</sup></b>               | XLNT coated sphere                                                      |   |     |    |   |   |   |    |   |     |
| <b>H<sup>1) 3)</sup></b>               | XL coated sphere                                                        |   |     |    |   |   |   |    |   |     |
| <b>Oversize</b>                        |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Standard outer diameter size                                            |   |     |    |   |   |   |    |   |     |
| <b>R10<sup>1)</sup></b>                | 0,1 mm oversized outer diameter                                         |   |     |    |   |   |   |    |   |     |
| <b>R20<sup>1)</sup></b>                | 0,2 mm oversized outer diameter                                         |   |     |    |   |   |   |    |   |     |

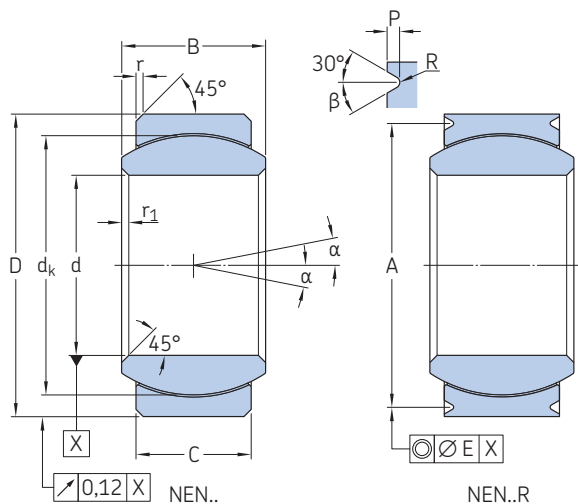
<sup>1)</sup> SKF option

<sup>2)</sup> Only available for  $d \geq 6$

<sup>3)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

## 2.19 Self-lubricating narrow (metric dimensions)

NEN.. (XRE.., 11..W.., 11..N.. or 11..E..)¹ bore code **30** to **55**



|                                |                                                                         |
|--------------------------------|-------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2755                                                                 |
| <b>Product standards</b>       | EN 2584 (standard starting torque)<br>EN 4038 (reduced starting torque) |
| <b>Materials</b>               |                                                                         |
| Liner                          | X1                                                                      |
| Inner ring                     | Corrosion-resistant steel 440C                                          |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                        |

| d    | β  | E    |
|------|----|------|
| mm   | °  | mm   |
| ≤ 8  | 20 | 0,08 |
| ≥ 10 | 30 | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d<br>Bore without liner | Δdmp  | Δds    | d <sub>a</sub><br>= d with lined bore H7 | D  | ΔDmp  | ΔDs     | C<br>±0,1 | B<br>0/-0,06 | d <sub>k</sub><br>≈ |
|-------------------|------------------------------------|-------|--------|------------------------------------------|----|-------|---------|-----------|--------------|---------------------|
| –                 | mm                                 | μm    |        | mm                                       |    | μm    |         | mm        |              |                     |
| <b>30</b>         | 30                                 | 0/-10 | +3/-13 | 30                                       | 51 | 0/-13 | +10/-23 | 24        | 28           | 45,2                |
| <b>35</b>         | 35                                 | 0/-12 | +3/-15 | 35                                       | 57 | 0/-13 | +10/-23 | 26        | 31           | 52,0                |
| <b>40</b>         | 40                                 | 0/-12 | +3/-15 | 40                                       | 64 | 0/-13 | +10/-23 | 29        | 34           | 58,0                |
| <b>45</b>         | 45                                 | 0/-12 | +3/-15 | 45                                       | 72 | 0/-13 | +10/-23 | 32        | 37           | 64,0                |
| <b>50</b>         | 50                                 | 0/-12 | +3/-15 | 50                                       | 80 | 0/-15 | +13/-28 | 34        | 41           | 72,0                |

### Dimensions cont., loads and torque

| Nominal bore code | Dimensions r <sub>1</sub><br>+0,3/0 | r       | A<br>+0,1/0 | P<br>0/-0,2 | R<br>+0,1/0 | α³) | Mass ≈ | Static limit loads<br>Radial C <sub>s</sub> | Axial C <sub>a</sub> ²) | Radial dynamic load C <sub>25</sub> | Starting torque³)<br>Standard | Reduced  |
|-------------------|-------------------------------------|---------|-------------|-------------|-------------|-----|--------|---------------------------------------------|-------------------------|-------------------------------------|-------------------------------|----------|
| –                 | mm                                  |         |             |             |             | °   | g      | kN                                          |                         |                                     | Nm                            |          |
| <b>30</b>         | 0,1                                 | 0,6/1   | 47,8        | 1,4         | 0,3         | 6   | 300    | 433,4                                       | 77,8                    | 216,7                               | 0,4/2,0                       | 0,02/0,4 |
| <b>35</b>         | 0,1                                 | 0,8/1,2 | 53,8        | 1,4         | 0,3         | 7   | 340    | 543,4                                       | 92,2                    | 271,7                               | 0,4/2,0                       | 0,02/0,4 |
| <b>40</b>         | 0,1                                 | 0,8/1,2 | 60,8        | 1,4         | 0,3         | 6   | 460    | 680,9                                       | 113,4                   | 340,3                               | 0,6/2,7                       | 0,03/0,6 |
| <b>45</b>         | 0,1                                 | 0,8/1,2 | 68,8        | 1,4         | 0,3         | 5   | 630    | 833,9                                       | 135,4                   | 416,9                               | 0,6/2,7                       | 0,03/0,6 |
| <b>50</b>         | 0,1                                 | 0,8/1,2 | 76,8        | 1,4         | 0,3         | 7   | 870    | 981,4                                       | 154,2                   | 490,7                               | 0,6/2,7                       | 0,03/0,6 |
| <b>55¹)</b>       | 0,1                                 | 0,8/1,2 | 92,8        | 1,5         | 0,3         | 10  | 1 580  | 1 350,5                                     | 235,8                   | –                                   | 0,6/3,5                       | 0,03/0,6 |

¹) Parts are delivered and marked with the following standard references: XRE.., 11C..W.. (Not plated) or 11F..W.. (Chromium plated sphere) for bore codes 5 and 22, 11C..N.. (Not plated) or 11F..N.. (Chromium plated sphere) for bore code 6 and 10, 11C..E.. (Not plated) or 11F..E.. (Chromium plated sphere) for bore code 8 and ≥ 12 (except 22)

²) These values can be limited by the unstaking load (contact SKF for more information)

³) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



# Cross-reference designation system to XRE., 11..W., 11..N.. or 11..E..

|                                        |                                                                         |   |     |    |   |   |   |    |   |     |
|----------------------------------------|-------------------------------------------------------------------------|---|-----|----|---|---|---|----|---|-----|
| Examples:                              | ZNEN17ARXTTFR10<br>NEN06PPD                                             | Z | NEN | 17 | A | R | X | TT | F | R10 |
| <b>Surface treatment of outer ring</b> |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Not plated                                                              |   |     |    |   |   |   |    |   |     |
| <b>Z<sup>1)</sup></b>                  | Cadmium plated external dimensions                                      |   |     |    |   |   |   |    |   |     |
| <b>SZ<sup>1)</sup></b>                 | Zinc-nickel plated external dimensions                                  |   |     |    |   |   |   |    |   |     |
| <b>Basic designation</b>               |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>Bore code</b>                       |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>Lined bore</b>                      |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Bore without liner                                                      |   |     |    |   |   |   |    |   |     |
| <b>A<sup>1) 2)</sup></b>               | Lined bore                                                              |   |     |    |   |   |   |    |   |     |
| <b>Chamfer and groove</b>              |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Chamfered outer ring                                                    |   |     |    |   |   |   |    |   |     |
| <b>R</b>                               | Grooved outer ring                                                      |   |     |    |   |   |   |    |   |     |
| <b>Starting torque</b>                 |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Standard                                                                |   |     |    |   |   |   |    |   |     |
| <b>X</b>                               | Reduced                                                                 |   |     |    |   |   |   |    |   |     |
| <b>Shield and seal</b>                 |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | No shield and seal                                                      |   |     |    |   |   |   |    |   |     |
| <b>TT<sup>1) 2)</sup></b>              | Sealed                                                                  |   |     |    |   |   |   |    |   |     |
| <b>PP<sup>1) 2)</sup></b>              | Shielded                                                                |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of inner ring</b> |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Not plated                                                              |   |     |    |   |   |   |    |   |     |
| <b>F</b>                               | Chromium plated sphere                                                  |   |     |    |   |   |   |    |   |     |
| <b>D<sup>1)</sup></b>                  | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |     |    |   |   |   |    |   |     |
| <b>V</b>                               | Passivated inner ring                                                   |   |     |    |   |   |   |    |   |     |
| <b>K<sup>1) 3)</sup></b>               | XLHP coated sphere                                                      |   |     |    |   |   |   |    |   |     |
| <b>N<sup>1) 3)</sup></b>               | XLNT coated sphere                                                      |   |     |    |   |   |   |    |   |     |
| <b>H<sup>1) 3)</sup></b>               | XL coated sphere                                                        |   |     |    |   |   |   |    |   |     |
| <b>Oversize</b>                        |                                                                         |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         | Standard outer diameter size                                            |   |     |    |   |   |   |    |   |     |
| <b>R10<sup>1)</sup></b>                | 0,1 mm oversized outer diameter                                         |   |     |    |   |   |   |    |   |     |
| <b>R20<sup>1)</sup></b>                | 0,2 mm oversized outer diameter                                         |   |     |    |   |   |   |    |   |     |

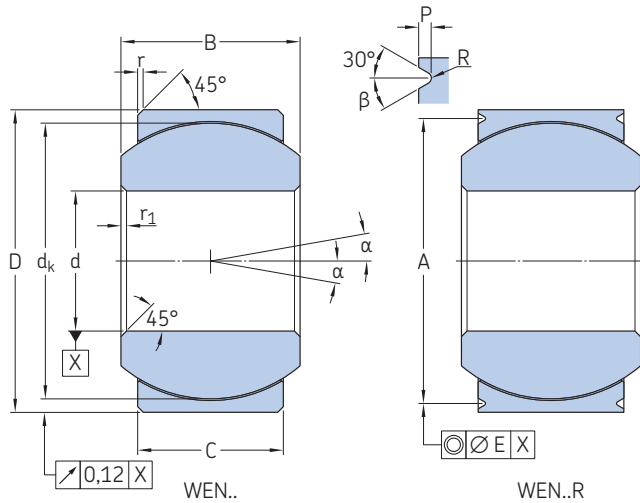
<sup>1)</sup> SKF option

<sup>2)</sup> Only available for  $d \geq 6$

<sup>3)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

## 2.20 Self-lubricating wide (metric dimensions)

WEN.. (XRL.., 11..E.. or 11..W..) bore code **05** to **17**



|                                |                                                                         |
|--------------------------------|-------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2755                                                                 |
| <b>Product standards</b>       | EN 2585 (standard starting torque)<br>EN 4039 (reduced starting torque) |
| <b>Materials</b>               |                                                                         |
| Liner                          | X1                                                                      |
| Inner ring                     | Corrosion-resistant steel 440C                                          |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                        |

| d    | β  | E    |
|------|----|------|
| mm   | °  | mm   |
| ≤ 8  | 20 | 0,08 |
| ≥ 10 | 30 | 0,12 |

### Dimensions

| Nominal bore code       | Dimensions d<br>Bore without liner | Δdmp | Δds    | d <sub>a</sub><br>= d with lined bore H7 | D  | ΔDmp | ΔDs    | C<br>±0,1 | B<br>0/-0,06 | d <sub>k</sub><br>≈ |
|-------------------------|------------------------------------|------|--------|------------------------------------------|----|------|--------|-----------|--------------|---------------------|
| –                       | mm                                 | μm   |        | mm                                       |    | μm   |        | mm        |              |                     |
| <b>05</b> <sup>5)</sup> | 5                                  | 0/-8 | +2/-10 | 5                                        | 16 | 0/-8 | +5/-13 | 8,5       | 11           | 13,4                |
| <b>06</b>               | 6                                  | 0/-8 | +2/-10 | 6                                        | 16 | 0/-8 | +5/-13 | 8,5       | 11           | 13,4                |
| <b>08</b>               | 8                                  | 0/-8 | +2/-10 | 8                                        | 18 | 0/-8 | +5/-13 | 8         | 11           | 15,1                |
| <b>10</b>               | 10                                 | 0/-8 | +2/-10 | 10                                       | 21 | 0/-9 | +6/-15 | 10        | 12,5         | 17,5                |
| <b>12</b>               | 12                                 | 0/-8 | +3/-11 | 12                                       | 26 | 0/-9 | +6/-15 | 13        | 16           | 22,3                |
| <b>15</b>               | 15                                 | 0/-8 | +3/-11 | 15                                       | 29 | 0/-9 | +6/-15 | 13,5      | 17           | 25,4                |
| <b>17</b>               | 17                                 | 0/-8 | +3/-11 | 17                                       | 30 | 0/-9 | +6/-15 | 14,5      | 18           | 27,0                |

### Dimensions cont., loads and torque

| Nominal bore code       | Dimensions r <sub>1</sub><br>+0,3/0 | r       | A<br>+0,1/0 | P<br>0/-0,2 | R<br>+0,1/0 | α <sup>4)</sup> | Mass<br>≈ | Static limit loads<br>Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>3)</sup> | Radial dynamic load<br>C <sub>25</sub> | Starting torque <sup>4)</sup><br>Standard | Reduced    |
|-------------------------|-------------------------------------|---------|-------------|-------------|-------------|-----------------|-----------|---------------------------------------------|------------------------------------|----------------------------------------|-------------------------------------------|------------|
| –                       | mm                                  |         |             |             |             | °               | g         | kN                                          |                                    |                                        | Nm                                        |            |
| <b>05</b> <sup>5)</sup> | 0,1                                 | 0,5/0,8 | 14,2        | 0,7         | 0,2         | 15              | 16        | 42,6                                        | 7,2                                | 25,6                                   | 0,08/0,5                                  | 0,005/0,06 |
| <b>06</b>               | 0,1                                 | 0,5/0,8 | 14,2        | 0,7         | 0,2         | 15              | 16        | 42,6                                        | 7,2                                | 25,6                                   | 0,08/0,5                                  | 0,005/0,06 |
| <b>08</b>               | 0,1                                 | 0,5/0,8 | 16,2        | 0,7         | 0,2         | 14              | 17        | 45,7                                        | 6,4                                | 27,4                                   | 0,12/0,8                                  | 0,006/0,08 |
| <b>10</b>               | 0,1                                 | 0,5/0,8 | 18,4        | 0,9         | 0,3         | 10              | 27        | 68,7                                        | 11,7                               | 41,2                                   | 0,12/0,8                                  | 0,008/0,1  |
| <b>12</b>               | 0,1                                 | 0,5/0,8 | 23,4        | 0,9         | 0,3         | 10              | 49        | 116,4                                       | 21,5                               | 64                                     | 0,12/0,8                                  | 0,008/0,1  |
| <b>15</b>               | 0,1                                 | 0,5/0,8 | 26,4        | 0,9         | 0,3         | 9               | 62        | 139,0                                       | 24,1                               | 76,5                                   | 0,12/0,8                                  | 0,01/0,12  |
| <b>17</b>               | 0,1                                 | 0,5/0,8 | 27,4        | 0,9         | 0,3         | 9               | 69        | 159,1                                       | 29,0                               | 87,5                                   | 0,12/0,8                                  | 0,01/0,12  |

1) SKF option

2) Parts are delivered and marked with the following standard references: XRL.., 11C..E.. (Not plated) or 11F..E.. (Chromium plated sphere) for bore code 5, 11C..W.. (Not plated) or 11F..W.. (Chromium plated sphere) for bore codes ≥ 6

3) These values can be limited by the unstaking load (contact SKF for more information)

4) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149

5) SKF option for reduced starting torque bearings



### Cross-reference designation system to XRL..., 11..E.. or 11..W..

| Examples:                              | Z | WEN | 17 | A | R | X | TT | F | R10 |
|----------------------------------------|---|-----|----|---|---|---|----|---|-----|
| ZWEN17ARXTTFR10                        |   |     |    |   |   |   |    |   |     |
| WEN05PPD                               |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of outer ring</b> |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>Z<sup>1)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>SZ<sup>1)</sup></b>                 |   |     |    |   |   |   |    |   |     |
| <b>Basic designation</b>               |   |     |    |   |   |   |    |   |     |
| <b>Bore code</b>                       |   |     |    |   |   |   |    |   |     |
| <b>Lined bore</b>                      |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>A<sup>1) 2)</sup></b>               |   |     |    |   |   |   |    |   |     |
| <b>Chamfer and groove</b>              |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>R</b>                               |   |     |    |   |   |   |    |   |     |
| <b>Starting torque</b>                 |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>X<sup>3)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>Shield and seal</b>                 |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>TT<sup>1) 2)</sup></b>              |   |     |    |   |   |   |    |   |     |
| <b>PP<sup>1) 2)</sup></b>              |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of inner ring</b> |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>F</b>                               |   |     |    |   |   |   |    |   |     |
| <b>D<sup>1)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>V</b>                               |   |     |    |   |   |   |    |   |     |
| <b>K<sup>1) 4)</sup></b>               |   |     |    |   |   |   |    |   |     |
| <b>N<sup>1) 4)</sup></b>               |   |     |    |   |   |   |    |   |     |
| <b>H<sup>1) 4)</sup></b>               |   |     |    |   |   |   |    |   |     |
| <b>Oversize</b>                        |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>R10<sup>1)</sup></b>                |   |     |    |   |   |   |    |   |     |
| <b>R20<sup>1)</sup></b>                |   |     |    |   |   |   |    |   |     |

<sup>1)</sup> SKF option

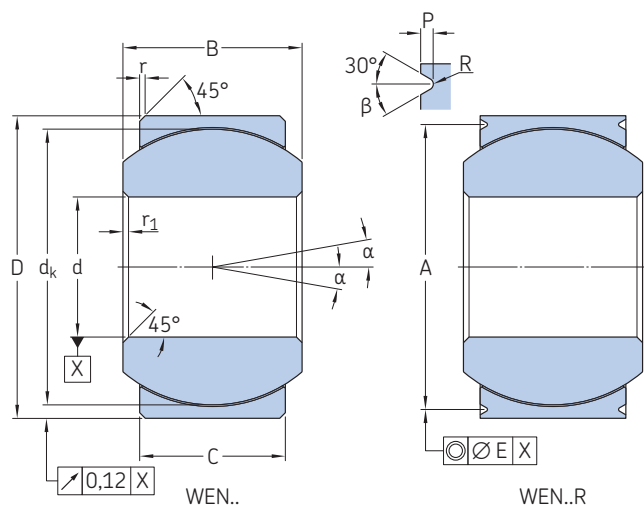
<sup>2)</sup> Only available for  $d \geq 6$

<sup>3)</sup> SKF option for  $d = 5$  and  $d = 55$

<sup>4)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

## 2.20 Self-lubricating wide (metric dimensions)

WEN.. (XRL..., 11C..E.. or 11F..W..) bore code **20 to 60**



|                                |                                                                         |
|--------------------------------|-------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2755                                                                 |
| <b>Product standards</b>       | EN 2585 (standard starting torque)<br>EN 4039 (reduced starting torque) |
| <b>Materials</b>               |                                                                         |
| Liner                          | X1                                                                      |
| Inner ring                     | Corrosion-resistant steel 440C                                          |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                        |

| d    | β  | E    |
|------|----|------|
| mm   | °  | mm   |
| ≤ 8  | 20 | 0,08 |
| ≥ 10 | 30 | 0,12 |

### Dimensions

| Nominal bore code      | Dimensions d<br>Bore without liner | Δdmp  | Δds    | d <sub>a</sub><br>= d with lined bore H7 | D   | ΔDmp  | ΔDs     | C<br>±0,1 | B<br>0/-0,06 | d <sub>k</sub><br>≈ |
|------------------------|------------------------------------|-------|--------|------------------------------------------|-----|-------|---------|-----------|--------------|---------------------|
| –                      | mm                                 | μm    |        | mm                                       |     | μm    |         | mm        |              |                     |
| <b>20</b>              | 20                                 | 0/-10 | +3/-13 | 20                                       | 35  | 0/-11 | +8/-19  | 16        | 20           | 30,9                |
| <b>25</b>              | 25                                 | 0/-10 | +3/-13 | 25                                       | 54  | 0/-13 | +10/-23 | 26        | 32           | 47,6                |
| <b>30</b>              | 30                                 | 0/-10 | +3/-13 | 30                                       | 60  | 0/-13 | +10/-23 | 28        | 34           | 53,2                |
| <b>35</b>              | 35                                 | 0/-12 | +3/-15 | 35                                       | 65  | 0/-13 | +10/-23 | 29        | 36           | 58,0                |
| <b>40</b>              | 40                                 | 0/-12 | +3/-15 | 40                                       | 68  | 0/-13 | +10/-23 | 31        | 38           | 60,4                |
| <b>45</b>              | 45                                 | 0/-12 | +3/-15 | 45                                       | 76  | 0/-13 | +10/-23 | 33        | 41           | 67,9                |
| <b>50</b>              | 50                                 | 0/-12 | +3/-15 | 50                                       | 82  | 0/-15 | +13/-28 | 35        | 44           | 74,6                |
| <b>55<sup>5)</sup></b> | 55                                 | 0/-12 | +3/-15 | 55                                       | 96  | 0/-15 | +13/-28 | 40        | 52           | 82,0                |
| <b>60<sup>1)</sup></b> | 60                                 | 0/-12 | +3/-15 | 60                                       | 105 | 0/-15 | +13/-28 | 48        | 60           | 92,0                |

### Dimensions cont., loads and torque

| Nominal bore code      | Dimensions r <sub>1</sub><br>+0,3/0 | r       | A<br>+0,1/0 | P<br>0/-0,2 | R<br>+0,1/0 | α <sup>4)</sup> | Mass<br>≈ | Static limit loads<br>Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>3)</sup> | Radial dynamic load<br>C <sub>25</sub> | Starting torque <sup>4)</sup><br>Standard | Reduced    |
|------------------------|-------------------------------------|---------|-------------|-------------|-------------|-----------------|-----------|---------------------------------------------|------------------------------------|----------------------------------------|-------------------------------------------|------------|
| –                      | mm                                  |         |             |             |             | °               | g         | kN                                          |                                    |                                        | Nm                                        |            |
| <b>20</b>              | 0,1                                 | 0,5/0,8 | 31,8        | 1,4         | 0,3         | 8               | 104       | 207,5                                       | 36,0                               | 113,9                                  | 0,12/0,8                                  | 0,01/0,12  |
| <b>25</b>              | 0,1                                 | 0,6/1   | 50,8        | 1,4         | 0,3         | 9               | 445       | 496,6                                       | 93,2                               | 248,3                                  | 0,25/1                                    | 0,015/0,25 |
| <b>30</b>              | 0,1                                 | 0,8/1,2 | 56,8        | 1,4         | 0,3         | 8               | 480       | 587,5                                       | 109,6                              | 293,7                                  | 0,4/2                                     | 0,02/0,4   |
| <b>35</b>              | 0,1                                 | 0,8/1,2 | 61,8        | 1,4         | 0,3         | 8               | 565       | 666,0                                       | 117,6                              | 333                                    | 0,4/2                                     | 0,02/0,4   |
| <b>40</b>              | 0,1                                 | 0,8/1,2 | 64,8        | 1,4         | 0,3         | 8               | 600       | 745,6                                       | 136,6                              | 372,8                                  | 0,6/2,7                                   | 0,025/0,5  |
| <b>45</b>              | 0,1                                 | 0,8/1,2 | 72,8        | 1,4         | 0,3         | 8               | 800       | 895,9                                       | 155,6                              | 447,9                                  | 0,6/2,7                                   | 0,03/0,6   |
| <b>50</b>              | 0,1                                 | 0,8/1,2 | 78,8        | 1,4         | 0,3         | 8               | 970       | 1 024,7                                     | 176,2                              | 512,3                                  | 0,6/2,7                                   | 0,03/0,6   |
| <b>55<sup>5)</sup></b> | 0,1                                 | 0,8/1,2 | 92,8        | 1,4         | 0,3         | 10              | 1 580     | 1 298,7                                     | 221,2                              | 649,3                                  | 0,6/2,7                                   | 0,03/0,6   |
| <b>60<sup>1)</sup></b> | 0,1                                 | 0,8/1,2 | 101,8       | 1,5         | 0,3         | 9               | 2 250     | 1 681,8                                     | 243,7                              | 864                                    | 0,6/2,7                                   | 0,03/0,6   |

1) SKF option

2) Parts are delivered and marked with the following standard references: XRL..., 11C..E.. (Not plated) or 11F..E.. (Chromium plated sphere) for bore code 5, 11C..W.. (Not plated) or 11F..W.. (Chromium plated sphere) for bore codes ≥ 6

3) These values can be limited by the unstaking load (contact SKF for more information)

4) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149

5) SKF option for reduced starting torque bearings



### Cross-reference designation system to XRL..., 11..E.. or 11..W..

| Examples:                              | Z | WEN | 17 | A | R | X | TT | F | R10 |
|----------------------------------------|---|-----|----|---|---|---|----|---|-----|
| ZWEN17ARXTTFR10                        |   |     |    |   |   |   |    |   |     |
| WEN05PPD                               |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of outer ring</b> |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>Z<sup>1)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>SZ<sup>1)</sup></b>                 |   |     |    |   |   |   |    |   |     |
| <b>Basic designation</b>               |   |     |    |   |   |   |    |   |     |
| <b>Bore code</b>                       |   |     |    |   |   |   |    |   |     |
| <b>Lined bore</b>                      |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>A<sup>1) 2)</sup></b>               |   |     |    |   |   |   |    |   |     |
| <b>Chamfer and groove</b>              |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>R</b>                               |   |     |    |   |   |   |    |   |     |
| <b>Starting torque</b>                 |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>X<sup>3)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>Shield and seal</b>                 |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>TT<sup>1) 2)</sup></b>              |   |     |    |   |   |   |    |   |     |
| <b>PP<sup>1) 2)</sup></b>              |   |     |    |   |   |   |    |   |     |
| <b>Surface treatment of inner ring</b> |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>F</b>                               |   |     |    |   |   |   |    |   |     |
| <b>D<sup>1)</sup></b>                  |   |     |    |   |   |   |    |   |     |
| <b>V</b>                               |   |     |    |   |   |   |    |   |     |
| <b>K<sup>1) 4)</sup></b>               |   |     |    |   |   |   |    |   |     |
| <b>N<sup>1) 4)</sup></b>               |   |     |    |   |   |   |    |   |     |
| <b>H<sup>1) 4)</sup></b>               |   |     |    |   |   |   |    |   |     |
| <b>Oversize</b>                        |   |     |    |   |   |   |    |   |     |
| <b>No code</b>                         |   |     |    |   |   |   |    |   |     |
| <b>R10<sup>1)</sup></b>                |   |     |    |   |   |   |    |   |     |
| <b>R20<sup>1)</sup></b>                |   |     |    |   |   |   |    |   |     |

<sup>1)</sup> SKF option

<sup>2)</sup> Only available for  $d \geq 6$

<sup>3)</sup> SKF option for  $d = 5$  and  $d = 55$

<sup>4)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

## 2.21



A diagram of a horizontal beam of length  $2l$ , supported at both ends. A triangular load is applied over the central portion of the beam, with its peak at the center. A point load  $P$  is applied at the center of the beam.

Technical drawings of two types of hydraulic cylinders: HMEN..SP and HMEN..RSP.

**HMEN..SP**

For bore codes 6B, 8B and 10B

**HMEN..RSP**

For bore codes 6, 8 and 10

| d  | $\beta$ | E    |
|----|---------|------|
| mm | °       | mm   |
| 6  | 20      | 0,08 |
| 8  | 30      | 0,08 |
| 10 | 30      | 0,12 |

| Nominal bore code | Dimensions<br>d<br>Bore without liner | $\Delta d_{mp}$ | $\Delta d_s$ | $d_a$<br>= d with lined bore<br>H7 | D  | $\Delta D_{mp}$ | $\Delta D_s$ | C<br>$\pm 0,1$ | B<br>0/−0,06 | $d_k$<br>≈ | $d_1$<br>≈ |
|-------------------|---------------------------------------|-----------------|--------------|------------------------------------|----|-----------------|--------------|----------------|--------------|------------|------------|
| —                 | mm                                    | μm              |              | mm                                 |    | μm              |              | mm             |              |            |            |
| 06 <sup>1)</sup>  | 6                                     | 0/−8            | +5/−13       | 6                                  | 18 | 0/−8            | +2/−10       | 8              | 14           | 15,0       | 9          |
| 06B               | 6                                     | 0/−8            | +5/−13       | 6                                  | 18 | 0/−8            | +2/−10       | 8              | 14           | 15,0       | 9          |
| 08 <sup>1)</sup>  | 8                                     | 0/−9            | +6/−15       | 8                                  | 21 | 0/−8            | +2/−10       | 10             | 15           | 17,5       | 11         |
| 08B               | 8                                     | 0/−9            | +6/−15       | 8                                  | 21 | 0/−8            | +2/−10       | 10             | 15           | 17,5       | 11         |
| 10 <sup>1)</sup>  | 10                                    | 0/−9            | +6/−15       | 10                                 | 26 | 0/−8            | +2/−10       | 13             | 20           | 22,2       | 13,5       |
| 10B               | 10                                    | 0/−9            | +6/−15       | 10                                 | 26 | 0/−8            | +2/−10       | 13             | 20           | 22,2       | 13,5       |

| Nominal<br>bore<br>code | Dimensions               |              |             | P<br>0/−0,2 | R<br>+0,1/0 | $\alpha^{(4)}$ | Mass<br>≈ | Static limit loads                    |                          | Radial dynamic<br>load<br>C25 | Starting torque <sup>4)</sup> |          |
|-------------------------|--------------------------|--------------|-------------|-------------|-------------|----------------|-----------|---------------------------------------|--------------------------|-------------------------------|-------------------------------|----------|
|                         | r <sub>1</sub><br>+0,5/0 | r<br>+ 0,3/0 | A<br>+0,1/0 |             |             |                |           | Axial<br>C <sub>a</sub> <sup>3)</sup> | Radial<br>C <sub>s</sub> |                               | Standard                      | Reduced  |
| –                       | mm                       |              |             |             |             | °              | g         | kN                                    |                          |                               | Nm                            |          |
| <b>06<sup>1)</sup></b>  | 0,3                      | 0,5          | 16,2        | 0,7         | 0,2         | 9              | 15        | 41,5                                  | 5,1                      | 16,6                          | 0,12/0,8                      | 0,01/0,2 |
| <b>06B</b>              | 0,3                      | 0,5          | 16,2        | 0,7         | 0,2         | 20             | 15        | 41,5                                  | 5,1                      | 16,6                          | 0,12/0,8                      | 0,01/0,2 |
| <b>08<sup>1)</sup></b>  | 0,3                      | 0,5          | 18,4        | 0,9         | 0,3         | 8              | 22        | 63                                    | 9,5                      | 25,2                          | 0,12/0,8                      | 0,02/0,4 |
| <b>08B</b>              | 0,3                      | 0,5          | 18,4        | 0,9         | 0,3         | 15             | 22        | 63                                    | 9,5                      | 25,2                          | 0,12/0,8                      | 0,02/0,4 |
| <b>10<sup>1)</sup></b>  | 0,3                      | 0,5          | 23,4        | 0,9         | 0,3         | 10             | 48        | 105,1                                 | 18,6                     | 42,2                          | 0,12/0,8                      | 0,02/0,4 |
| <b>10B</b>              | 0,3                      | 0,5          | 23,4        | 0,9         | 0,3         | 16             | 48        | 105,1                                 | 18,6                     | 42,2                          | 0,12/0,8                      | 0,02/0,4 |

4) Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



### Cross-reference designation system to RL..SP.. or 11E..H..

|                                        |                                                                         |   |      |    |   |   |   |    |   |     |
|----------------------------------------|-------------------------------------------------------------------------|---|------|----|---|---|---|----|---|-----|
| Examples:                              | ZHMEN06ARXTTFR10                                                        | Z | HMEN | 06 | A | R | X | TT | F | R10 |
|                                        | HMEN08PPD                                                               |   |      |    |   |   |   |    |   |     |
| <b>Surface treatment of outer ring</b> |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>No code</b>                         | Not plated                                                              |   |      |    |   |   |   |    |   |     |
| <b>Z<sup>1)</sup></b>                  | Cadmium plated external dimensions                                      |   |      |    |   |   |   |    |   |     |
| <b>SZ<sup>1)</sup></b>                 | Zinc-nickel plated external dimensions                                  |   |      |    |   |   |   |    |   |     |
| <b>Basic designation</b>               |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>Bore code</b>                       |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>Lined bore</b>                      |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>No code</b>                         | Bore without liner                                                      |   |      |    |   |   |   |    |   |     |
| <b>A<sup>1) 2)</sup></b>               | Lined bore                                                              |   |      |    |   |   |   |    |   |     |
| <b>Chamfer and groove</b>              |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>No code</b>                         | Chamfered outer ring                                                    |   |      |    |   |   |   |    |   |     |
| <b>R</b>                               | Grooved outer ring                                                      |   |      |    |   |   |   |    |   |     |
| <b>Starting torque</b>                 |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>No code</b>                         | Standard                                                                |   |      |    |   |   |   |    |   |     |
| <b>X</b>                               | Reduced                                                                 |   |      |    |   |   |   |    |   |     |
| <b>Shield and seal</b>                 |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>No code</b>                         | No shield and seal                                                      |   |      |    |   |   |   |    |   |     |
| <b>TT<sup>1) 2)</sup></b>              | Sealed                                                                  |   |      |    |   |   |   |    |   |     |
| <b>PP<sup>1) 2)</sup></b>              | Shielded                                                                |   |      |    |   |   |   |    |   |     |
| <b>Surface treatment of inner ring</b> |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>No code</b>                         | Not plated                                                              |   |      |    |   |   |   |    |   |     |
| <b>F<sup>1)</sup></b>                  | Chromium plated sphere                                                  |   |      |    |   |   |   |    |   |     |
| <b>D<sup>1)</sup></b>                  | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |      |    |   |   |   |    |   |     |
| <b>V</b>                               | Passivated inner ring                                                   |   |      |    |   |   |   |    |   |     |
| <b>K<sup>1) 3)</sup></b>               | XLHP coated sphere                                                      |   |      |    |   |   |   |    |   |     |
| <b>N<sup>1) 3)</sup></b>               | XLNT coated sphere                                                      |   |      |    |   |   |   |    |   |     |
| <b>H<sup>1) 3)</sup></b>               | XL coated sphere                                                        |   |      |    |   |   |   |    |   |     |
| <b>Oversize</b>                        |                                                                         |   |      |    |   |   |   |    |   |     |
| <b>No code</b>                         | Standard outer diameter size                                            |   |      |    |   |   |   |    |   |     |
| <b>R10<sup>1)</sup></b>                | 0,1 mm oversized outer diameter                                         |   |      |    |   |   |   |    |   |     |
| <b>R20<sup>1)</sup></b>                | 0,2 mm oversized outer diameter                                         |   |      |    |   |   |   |    |   |     |

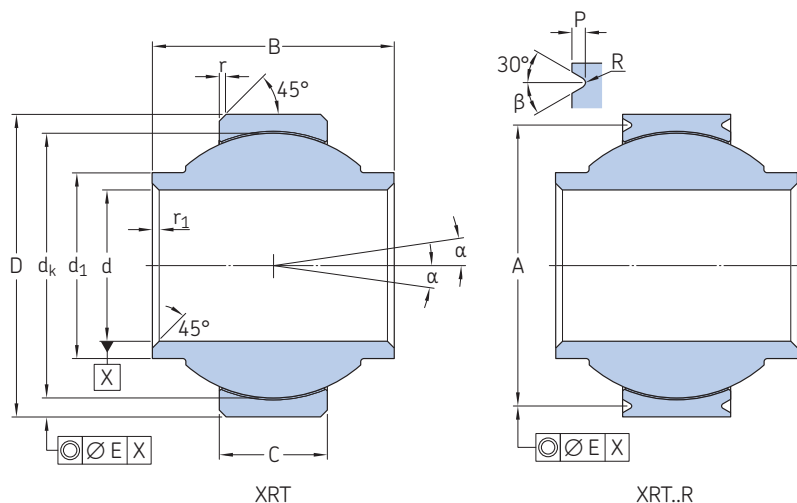
<sup>1)</sup> SKF option

<sup>2)</sup> Only available for  $d \geq 6$

<sup>3)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

## 2.22 Self-lubricating high misalignment (metric dimensions)

XRT...



|                                |                                  |
|--------------------------------|----------------------------------|
| <b>Technical specification</b> | –                                |
| <b>Product standards</b>       | –                                |
| <b>Materials</b>               |                                  |
| Liner                          | X1                               |
| Inner ring                     | Corrosion-resistant steel 440C   |
| Outer ring                     | Corrosion-resistant steel 17-4PH |

| d   | β  | E    |
|-----|----|------|
| mm  | °  | mm   |
| ≤ 6 | 20 | 0,08 |
| ≥ 8 | 30 | 0,12 |

### Dimensions

| Nominal bore code | Dimensions d<br>Bore without liner | Δdmp  | d <sub>a</sub><br>= d with lined bore H7 | D  | ΔDmp  | C<br>±0,1 | B<br>0/-0,06 | d <sub>k</sub><br>≈ | d <sub>1</sub><br>≈ |
|-------------------|------------------------------------|-------|------------------------------------------|----|-------|-----------|--------------|---------------------|---------------------|
| –                 | mm                                 | μm    | mm                                       |    | μm    | mm        |              |                     |                     |
| 5                 | 5                                  | 0/-8  | 5                                        | 14 | 0/-8  | 5         | 12,5         | 11,1                | 7,8                 |
| 6                 | 6                                  | 0/-8  | 6                                        | 19 | 0/-8  | 6         | 15           | 15,1                | 9,6                 |
| 8                 | 8                                  | 0/-8  | 8                                        | 25 | 0/-9  | 9         | 21           | 19,8                | 13,3                |
| 10                | 10                                 | 0/-8  | 10                                       | 25 | 0/-9  | 9         | 21           | 19,8                | 13,3                |
| 12                | 12                                 | 0/-8  | 12                                       | 30 | 0/-9  | 10        | 24           | 25,0                | 17,7                |
| 17                | 17                                 | 0/-8  | 17                                       | 36 | 0/-11 | 14        | 30           | 31,5                | 21,8                |
| 20                | 20                                 | 0/-10 | 20                                       | 40 | 0/-11 | 16        | 33           | 34,0                | 24,0                |
| 22                | 22                                 | 0/-10 | 22                                       | 45 | 0/-11 | 16        | 36           | 38,9                | 28,3                |
| 25                | 25                                 | 0/-10 | 25                                       | 54 | 0/-13 | 21        | 48           | 47,6                | 32,2                |
| 30                | 30                                 | 0/-10 | 30                                       | 65 | 0/-13 | 25        | 48           | 57,1                | 38,8                |

### Dimensions cont., loads and torque

| Nominal bore code | Dimensions r <sub>1</sub><br>+0,3/0 | r<br>+0,3/0 | A<br>+0,15/0 | P<br>0/-0,2 | R<br>+0,1/0 | α <sup>2)</sup> | Mass<br>≈ | Static limit loads<br>Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>1)</sup> | Radial dynamic load<br>C <sub>25</sub> | Starting torque <sup>2)</sup><br>Standard | Reduced    |
|-------------------|-------------------------------------|-------------|--------------|-------------|-------------|-----------------|-----------|---------------------------------------------|------------------------------------|----------------------------------------|-------------------------------------------|------------|
| –                 | mm                                  |             |              |             |             | °               | g         | kN                                          |                                    |                                        | Nm                                        |            |
| 5                 | 0,1                                 | 0,5         | 12,2         | 0,7         | 0,2         | 15              | 8         | 16,5                                        | 0,7                                | 6,6                                    | 0,06/0,3                                  | 0,005/0,06 |
| 6                 | 0,1                                 | 0,5         | 17,2         | 0,7         | 0,2         | 24              | 17        | 30,5                                        | 1,3                                | 12,2                                   | 0,06/0,3                                  | 0,005/0,06 |
| 8                 | 0,1                                 | 0,5         | 22,4         | 0,9         | 0,3         | 20              | 39        | 70,4                                        | 8,4                                | 28,2                                   | 0,08/0,4                                  | 0,005/0,06 |
| 10                | 0,1                                 | 0,5         | 22,4         | 0,9         | 0,3         | 20              | 34        | 70,4                                        | 8,4                                | 28,2                                   | 0,1/0,5                                   | 0,008/0,1  |
| 12                | 0,1                                 | 0,5         | 27,4         | 0,9         | 0,3         | 20              | 65        | 95,8                                        | 10,3                               | 38,3                                   | 0,1/0,5                                   | 0,008/0,1  |
| 17                | 0,1                                 | 0,5         | 33,4         | 0,9         | 0,3         | 20              | 110       | 174,6                                       | 25,8                               | 69,8                                   | 0,12/0,7                                  | 0,008/0,1  |
| 20                | 0,1                                 | 0,5         | 36,8         | 1,4         | 0,3         | 19              | 142       | 234,4                                       | 33,3                               | 93,8                                   | 0,12/0,7                                  | 0,008/0,1  |
| 22                | 0,1                                 | 0,5         | 41,8         | 1,4         | 0,3         | 19              | 194       | 266,3                                       | 33,3                               | 106,5                                  | 0,25/1                                    | 0,015/0,25 |
| 25                | 0,1                                 | 0,5         | 50,8         | 1,4         | 0,3         | 21              | 401       | 391,8                                       | 55,9                               | 156,7                                  | 0,25/1                                    | 0,015/0,25 |
| 30                | 0,1                                 | 0,5         | 61,8         | 1,4         | 0,3         | 21              | 600       | 583,7                                       | 75,9                               | 233,5                                  | 0,4/1,8                                   | 0,02/0,4   |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149





## Designation system

Examples: ZXRT17ARXTTCP6R10  
XRT 5PPCP109

Z XRT 17 A R X TT CP6 R10

### Surface treatment of outer ring

**No code** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

### Basic designation

#### Bore code

#### Lined bore

**No code** Bore without liner  
**A<sup>1)</sup>** Lined bore

### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

### Starting torque

**No code** Standard  
**X** Reduced

### Shield and seal

**No code** No shield and seal  
**TT<sup>1)</sup>** Sealed  
**PP<sup>1)</sup>** Shielded

### Surface treatment of inner ring

**No code** Not plated  
**CP6** Chromium plated sphere  
**CP109** XCR plating on sphere (chromium 6 free replacement to chromium plating)  
**CP55** Passivated inner ring

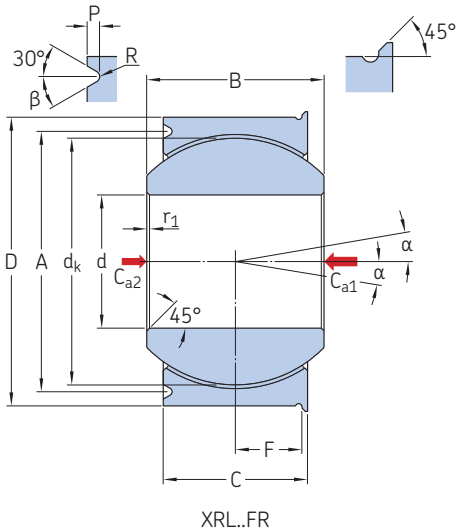
### Oversize

**No code** Standard outer diameter size  
**R10** 0,1 mm oversized outer diameter  
**R20** 0,2 mm oversized outer diameter

<sup>1)</sup> Only available for  $d \geq 6$

## 2.23 Self-lubricating pre-staked (metric dimensions)

XRL..FR



XRL..FR

|                                |                                  |
|--------------------------------|----------------------------------|
| <b>Technical specification</b> | –                                |
| <b>Product standards</b>       | –                                |
| <b>Materials</b>               |                                  |
| Liner                          | X1                               |
| Inner ring                     | Corrosion-resistant steel 440C   |
| Outer ring                     | Corrosion-resistant steel 17-4PH |

| d   | β  |
|-----|----|
| mm  | °  |
| ≤ 6 | 20 |
| ≥ 8 | 30 |

### Dimensions

| Nominal bore code | Dimensions<br>d<br>Bore without liner | Δdmp  | d <sub>a</sub><br>= d with lined bore<br>H7 | D  | ΔDmp  | C<br>±0,1 | B<br>0/-0,06 | d <sub>k</sub><br>≈ |
|-------------------|---------------------------------------|-------|---------------------------------------------|----|-------|-----------|--------------|---------------------|
| –                 | mm                                    | μm    | mm                                          |    | μm    | mm        |              |                     |
| 5                 | 5                                     | 0/-8  | 5                                           | 16 | 0/-8  | 8,5       | 11           | 13,4                |
| 6                 | 6                                     | 0/-8  | 6                                           | 16 | 0/-8  | 8,5       | 11           | 13,4                |
| 8                 | 8                                     | 0/-8  | 8                                           | 18 | 0/-8  | 8         | 11           | 15,1                |
| 10                | 10                                    | 0/-8  | 10                                          | 21 | 0/-9  | 10        | 12,5         | 17,5                |
| 12                | 12                                    | 0/-8  | 12                                          | 26 | 0/-9  | 13        | 16           | 22,3                |
| 15                | 15                                    | 0/-8  | 15                                          | 29 | 0/-9  | 13,5      | 17           | 25,4                |
| 17                | 17                                    | 0/-8  | 17                                          | 30 | 0/-9  | 14,5      | 18           | 27,0                |
| 20                | 20                                    | 0/-10 | 20                                          | 35 | 0/-11 | 16        | 20           | 30,9                |
| 25                | 25                                    | 0/-10 | 25                                          | 54 | 0/-13 | 26        | 32           | 47,6                |
| 30                | 30                                    | 0/-10 | 30                                          | 60 | 0/-13 | 28        | 34           | 53,2                |
| 35                | 35                                    | 0/-12 | 35                                          | 65 | 0/-13 | 29        | 36           | 58,0                |
| 40                | 40                                    | 0/-12 | 40                                          | 68 | 0/-13 | 31        | 38           | 60,4                |
| 45                | 45                                    | 0/-12 | 45                                          | 76 | 0/-13 | 33        | 41           | 67,9                |
| 50                | 50                                    | 0/-12 | 50                                          | 82 | 0/-13 | 35        | 44           | 74,6                |

### Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>r <sub>1</sub><br>+0,3/0 | F<br>+0,1/0 | A<br>+0,1/0 | P<br>0/-0,2 | R<br>+0,1/0 | α <sup>1)</sup> | Mass<br>≈ | Static limit loads<br>Axial<br>C <sub>a1</sub> | Axial<br>C <sub>a2</sub> | Radial<br>C <sub>s</sub> | Radial<br>dynamic load<br>C <sub>25</sub> | Starting torque <sup>1)</sup><br>Standard | Reduced    |
|-------------------|----------------------------------------|-------------|-------------|-------------|-------------|-----------------|-----------|------------------------------------------------|--------------------------|--------------------------|-------------------------------------------|-------------------------------------------|------------|
| –                 | mm                                     |             |             |             |             | °               | g         | kN                                             |                          |                          |                                           | Nm                                        |            |
| 5                 | 0,1                                    | 3,7         | 14,2        | 0,7         | 0,2         | 15              | 16        | 7,2                                            | 5                        | 42,6                     | 25,6                                      | 0,08/0,5                                  | 0,005/0,06 |
| 6                 | 0,1                                    | 3,7         | 14,2        | 0,7         | 0,2         | 15              | 16        | 7,2                                            | 5                        | 42,6                     | 25,6                                      | 0,08/0,5                                  | 0,005/0,06 |
| 8                 | 0,1                                    | 3,45        | 16,2        | 0,7         | 0,2         | 14              | 17        | 6,4                                            | 5                        | 45,7                     | 27,4                                      | 0,12/0,8                                  | 0,006/0,08 |
| 10                | 0,1                                    | 4,25        | 18,4        | 0,9         | 0,3         | 10              | 27        | 11,7                                           | 9                        | 68,7                     | 41,2                                      | 0,12/0,8                                  | 0,008/0,1  |
| 12                | 0,1                                    | 5,75        | 23,4        | 0,9         | 0,3         | 10              | 49        | 21,5                                           | 14                       | 116,4                    | 64                                        | 0,12/0,8                                  | 0,008/0,1  |
| 15                | 0,1                                    | 6           | 26,4        | 0,9         | 0,3         | 9               | 62        | 24,1                                           | 16                       | 139,0                    | 76,5                                      | 0,12/0,8                                  | 0,01/0,12  |
| 17                | 0,1                                    | 6,5         | 27,4        | 0,9         | 0,3         | 9               | 69        | 29                                             | 18                       | 59,1                     | 87,5                                      | 0,12/0,8                                  | 0,01/0,12  |
| 20                | 0,1                                    | 6,75        | 31,8        | 1,4         | 0,3         | 8               | 104       | 36                                             | 23                       | 207,5                    | 113,9                                     | 0,12/0,8                                  | 0,01/0,12  |
| 25                | 0,1                                    | 11,75       | 50,8        | 1,4         | 0,3         | 9               | 445       | 93,2                                           | 40                       | 496,6                    | 248,3                                     | 0,25/1                                    | 0,015/0,25 |
| 30                | 0,1                                    | 12,75       | 56,8        | 1,4         | 0,3         | 8               | 480       | 109,6                                          | 45                       | 745,6                    | 293,7                                     | 0,4/2                                     | 0,02/0,4   |
| 35                | 0,1                                    | 13,25       | 61,8        | 1,4         | 0,3         | 8               | 565       | 117,6                                          | 50                       | 895,9                    | 333                                       | 0,4/2                                     | 0,02/0,4   |
| 40                | 0,1                                    | 14,25       | 64,8        | 1,4         | 0,3         | 8               | 600       | 136,6                                          | 53                       | 1 024,7                  | 372,8                                     | 0,6/2,7                                   | 0,025/0,5  |
| 45                | 0,1                                    | 15,25       | 72,8        | 1,4         | 0,3         | 8               | 800       | 155,6                                          | 60                       | 1 298,7                  | 447,9                                     | 0,6/2,7                                   | 0,03/0,6   |
| 50                | 0,1                                    | 16,25       | 78,8        | 1,4         | 0,3         | 8               | 970       | 176,2                                          | 65                       | 1 681,8                  | 512,3                                     | 0,6/2,7                                   | 0,03/0,6   |

<sup>1)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



## Designation system

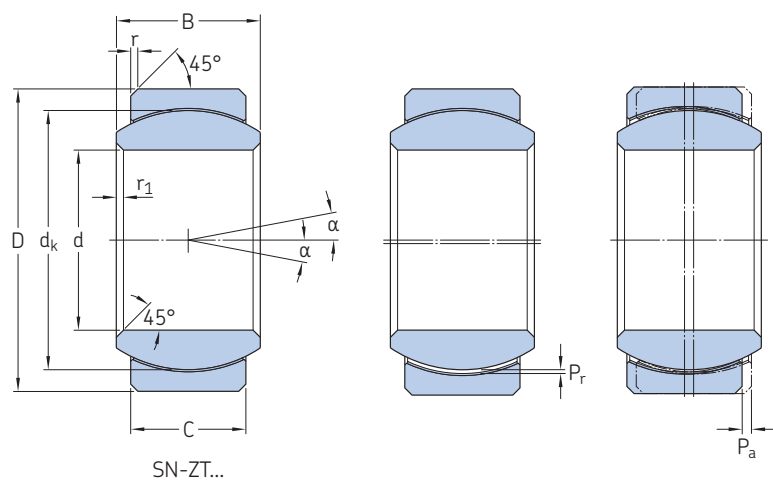
Examples: ZXRL17FRARXTTCP6R10  
XRL 5FRPPCP109

|                                        | Z | XRL | 17 | FR | A | R | X | TT | CP6 | R10 |
|----------------------------------------|---|-----|----|----|---|---|---|----|-----|-----|
| <b>Surface treatment of outer ring</b> |   |     |    |    |   |   |   |    |     |     |
| No code                                |   |     |    |    |   |   |   |    |     |     |
| Z                                      |   |     |    |    |   |   |   |    |     |     |
| SZ                                     |   |     |    |    |   |   |   |    |     |     |
| <b>Basic designation</b>               |   |     |    |    |   |   |   |    |     |     |
| <b>Bore code</b>                       |   |     |    |    |   |   |   |    |     |     |
| Lined bore                             |   |     |    |    |   |   |   |    |     |     |
| No code                                |   |     |    |    |   |   |   |    |     |     |
| A <sup>1)</sup>                        |   |     |    |    |   |   |   |    |     |     |
| <b>Chamfer and groove</b>              |   |     |    |    |   |   |   |    |     |     |
| No code                                |   |     |    |    |   |   |   |    |     |     |
| R                                      |   |     |    |    |   |   |   |    |     |     |
| <b>Starting torque</b>                 |   |     |    |    |   |   |   |    |     |     |
| No code                                |   |     |    |    |   |   |   |    |     |     |
| X                                      |   |     |    |    |   |   |   |    |     |     |
| <b>Shield and seal</b>                 |   |     |    |    |   |   |   |    |     |     |
| No code                                |   |     |    |    |   |   |   |    |     |     |
| TT <sup>1)</sup>                       |   |     |    |    |   |   |   |    |     |     |
| PP <sup>1)</sup>                       |   |     |    |    |   |   |   |    |     |     |
| <b>Surface treatment of inner ring</b> |   |     |    |    |   |   |   |    |     |     |
| No code                                |   |     |    |    |   |   |   |    |     |     |
| CP6                                    |   |     |    |    |   |   |   |    |     |     |
| CP109                                  |   |     |    |    |   |   |   |    |     |     |
| CP55                                   |   |     |    |    |   |   |   |    |     |     |
| <b>Oversize</b>                        |   |     |    |    |   |   |   |    |     |     |
| No code                                |   |     |    |    |   |   |   |    |     |     |
| R10                                    |   |     |    |    |   |   |   |    |     |     |
| R20                                    |   |     |    |    |   |   |   |    |     |     |

<sup>1)</sup> Only available for  $d \geq 6$

## 2.24 Self-lubricating narrow controlled clearance (inch dimensions)

SN..ZT...



|                         |                                  |
|-------------------------|----------------------------------|
| Technical specification | —                                |
| Product standards       | —                                |
| Materials               | X1                               |
| Liner                   | Corrosion-resistant steel 440C   |
| Inner ring              | Corrosion-resistant steel 17-4PH |
| Outer ring              |                                  |

### Dimensions

| Nominal bore code | Size | Dimensions<br>d<br>0/-0.0005<br>0/-0.0127 | D<br>0/-0.0005<br>0/-0.0127 | C<br>0/-0.010<br>0/-0.254 | B<br>0/-0.002<br>0/-0.051 | d <sub>k</sub><br>≈ | r<br>0/-0.010<br>0/-0.254 | r <sub>1</sub><br>+0.010/0<br>+0.254/0 | α     |
|-------------------|------|-------------------------------------------|-----------------------------|---------------------------|---------------------------|---------------------|---------------------------|----------------------------------------|-------|
| —                 |      | in/mm                                     |                             |                           |                           |                     |                           |                                        | °     |
| 03                | 3/16 | 0.1900<br>4,8260                          | 0.5625<br>14,2875           | 0.223<br>5,664            | 0.281<br>7,137            | 0.437<br>11,100     | 0.020<br>0,508            | 0.005<br>0,127                         | 10    |
| 04                | 1/4  | 0.2500<br>6,3500                          | 0.6562<br>16,6675           | 0.255<br>6,477            | 0.343<br>8,712            | 0.500<br>12,700     | 0.020<br>0,508            | 0.005<br>0,127                         | 12    |
| 05                | 5/16 | 0.3125<br>7,9375                          | 0.7500<br>19,0500           | 0.286<br>7,264            | 0.375<br>9,525            | 0.593<br>15,062     | 0.025<br>0,635            | 0.005<br>0,127                         | 11    |
| 06                | 3/8  | 0.3750<br>9,5250                          | 0.8125<br>20,6375           | 0.317<br>8,052            | 0.406<br>10,312           | 0.625<br>15,875     | 0.025<br>0,635            | 0.005<br>0,127                         | 10    |
| 08                | 1/2  | 0.5000<br>12,7000                         | 1.0000<br>25,4000           | 0.395<br>10,033           | 0.500<br>12,700           | 0.781<br>19,837     | 0.030<br>0,762            | 0.005<br>0,127                         | 9°30' |
| 10                | 5/8  | 0.6250<br>15,8750                         | 1.1875<br>30,1625           | 0.505<br>12,827           | 0.625<br>15,875           | 1.000<br>25,400     | 0.030<br>0,762            | 0.005<br>0,127                         | 8°30' |
| 12                | 3/4  | 0.7500<br>19,0500                         | 1.4375<br>36,5125           | 0.598<br>15,189           | 0.750<br>19,050           | 1.250<br>31,750     | 0.030<br>0,762            | 0.005<br>0,127                         | 8°30' |
| 14                | 7/8  | 0.8750<br>22,2250                         | 1.5625<br>39,6875           | 0.708<br>17,983           | 0.875<br>22,225           | 1.375<br>34,925     | 0.040<br>1,016            | 0.005<br>0,127                         | 9     |
| 16                | 1    | 1.0000<br>25,4000                         | 1.7500<br>44,4500           | 0.802<br>20,371           | 1.000<br>25,400           | 1.562<br>39,675     | 0.040<br>1,016            | 0.005<br>0,127                         | 9°30' |



### Designation system

Examples: SN04ZTCY2  
SN12ZT

SN 04 ZT C Y2

### Basic designation

Bore code (multiples of 1/16 inch)

Surface treatment of outer ring

No code Not plated  
C Cadmium plated external dimensions  
J Zinc-nickel plated external dimensions

Oversize

No code Standard outer diameter size  
Y1 0.005 in/0,127 mm oversized outer diameter  
Y2 0.010 in/0,254 mm oversized outer diameter  
Y3 0.015 in/0,381 mm oversized outer diameter  
Y4 0.020 in/0,508 mm oversized outer diameter

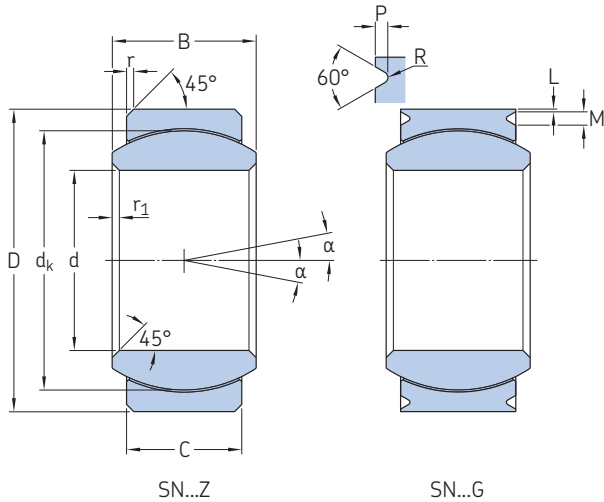
### Loads, torque and clearance

| Nominal bore code | Size | Mass<br>≈     | Static limit loads       |                                       | No load dynamic torque<br>max | Clearances       |                  |
|-------------------|------|---------------|--------------------------|---------------------------------------|-------------------------------|------------------|------------------|
|                   |      |               | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>1)</sup> |                               | Radial max       | Axial max        |
| –                 |      | lb/g          | lbf/kN                   |                                       | lbf-in/Nm                     | in/mm            |                  |
| 03                | 3/16 | 0.02<br>9,1   | 4 270<br>18,99           | 500<br>2,22                           | 0.06<br>0,007                 | 0.0010<br>0,0254 | 0.0035<br>0,0889 |
| 04                | 1/4  | 0.02<br>9,1   | 5 910<br>26,29           | 750<br>3,34                           | 0.06<br>0,007                 | 0.0010<br>0,0254 | 0.0035<br>0,0889 |
| 05                | 5/16 | 0.03<br>13,6  | 8 110<br>36,08           | 1 000<br>4,45                         | 0.06<br>0,007                 | 0.0010<br>0,0254 | 0.0035<br>0,0889 |
| 06                | 3/8  | 0.04<br>18,1  | 9 714<br>43,21           | 1 400<br>6,23                         | 0.08<br>0,009                 | 0.0012<br>0,0305 | 0.0040<br>0,1016 |
| 08                | 1/2  | 0.07<br>31,8  | 16 360<br>72,77          | 2 700<br>12,01                        | 0.08<br>0,009                 | 0.0012<br>0,0305 | 0.0040<br>0,1016 |
| 10                | 5/8  | 0.12<br>54,4  | 27 540<br>122,50         | 4 750<br>21,13                        | 0.12<br>0,014                 | 0.0015<br>0,0381 | 0.0045<br>0,1143 |
| 12                | 3/4  | 0.21<br>95,3  | 41 400<br>184,16         | 6 900<br>30,69                        | 0.12<br>0,014                 | 0.0015<br>0,0381 | 0.0045<br>0,1143 |
| 14                | 7/8  | 0.27<br>122,5 | 50 990<br>226,81         | 7 900<br>35,14                        | 0.18<br>0,020                 | 0.0018<br>0,0457 | 0.0055<br>0,1397 |
| 16                | 1    | 0.39<br>176,9 | 66 730<br>296,83         | 10 700<br>47,60                       | 0.25<br>0,028                 | 0.0020<br>0,0508 | 0.0060<br>0,1524 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

## 2.25 Self-lubricating narrow (inch dimensions)

SN... bore code **03** to **10**



|                                |                                                                  |
|--------------------------------|------------------------------------------------------------------|
| <b>Technical specification</b> | AS 8942                                                          |
| <b>Product standards</b>       | NSA 8134 (chamfered outer ring)<br>NSA 8136 (grooved outer ring) |
| <b>Materials</b>               |                                                                  |
| Liner                          | X1                                                               |
| Inner ring                     | Corrosion-resistant steel 440C                                   |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                 |

| Nominal bore code | L<br>+0.010/0<br>+0.254/0 | M<br>+0.010/0<br>+0.254/0 |
|-------------------|---------------------------|---------------------------|
| -                 | in/mm                     |                           |
| ≤ 04              | 0.010/0,254               | 0.035/0,889               |
| 05 to 07          | 0.020/0,508               | 0.045/1,143               |
| ≥ 08              | 0.020/0,508               | 0.070/1,778               |

### Dimensions

| Nominal bore code | Size        | Dimensions             |                        | C                    | B                    | dk              | r                    | r1                   | P                   | R                    | α     |
|-------------------|-------------|------------------------|------------------------|----------------------|----------------------|-----------------|----------------------|----------------------|---------------------|----------------------|-------|
|                   |             | d                      | D                      |                      |                      |                 |                      |                      |                     |                      |       |
|                   |             | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 0/-0.010<br>0/-0,254 | 0/-0.002<br>0/-0,051 | ≈               | 0/-0.010<br>0/-0,254 | +0.010/0<br>+0,254/0 | 0.015/0<br>+0,381/0 | +0.010/0<br>+0,254/0 | °     |
| -                 |             | in/mm                  |                        |                      |                      |                 |                      |                      |                     |                      | °     |
| <b>03</b>         | <b>3/16</b> | 0.1900<br>4,8260       | 0.5625<br>14,2875      | 0.223<br>5,664       | 0.281<br>7,137       | 0.437<br>11,100 | 0.020<br>0,508       | 0.005<br>0,127       | 0.015<br>0,381      | 0.005<br>0,127       | 10    |
| <b>04</b>         | <b>1/4</b>  | 0.2500<br>6,3500       | 0.6562<br>16,6675      | 0.255<br>6,477       | 0.343<br>8,712       | 0.500<br>12,703 | 0.020<br>0,508       | 0.005<br>0,127       | 0.015<br>0,381      | 0.005<br>0,127       | 12    |
| <b>05</b>         | <b>5/16</b> | 0.3125<br>7,9375       | 0.7500<br>19,0500      | 0.286<br>7,264       | 0.375<br>9,525       | 0.593<br>15,062 | 0.025<br>0,635       | 0.005<br>0,127       | 0.025<br>0,635      | 0.005<br>0,127       | 11    |
| <b>06</b>         | <b>3/8</b>  | 0.3750<br>9,5250       | 0.8125<br>20,6375      | 0.317<br>8,052       | 0.406<br>10,312      | 0.625<br>15,875 | 0.030<br>0,762       | 0.005<br>0,127       | 0.025<br>0,635      | 0.010<br>0,254       | 10    |
| <b>07</b>         | <b>7/16</b> | 0.4375<br>11,1125      | 0.9062<br>23,0175      | 0.348<br>8,839       | 0.437<br>11,100      | 0.687<br>17,450 | 0.030<br>0,762       | 0.005<br>0,127       | 0.025<br>0,635      | 0.010<br>0,254       | 9     |
| <b>08</b>         | <b>1/2</b>  | 0.5000<br>12,7000      | 1.0000<br>25,4000      | 0.395<br>10,033      | 0.500<br>12,700      | 0.781<br>19,837 | 0.030<br>0,762       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254       | 9°30' |
| <b>09</b>         | <b>9/16</b> | 0.5625<br>14,2875      | 1.0937<br>27,7800      | 0.442<br>11,227      | 0.562<br>14,275      | 0.875<br>22,225 | 0.030<br>0,762       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254       | 10    |
| <b>10</b>         | <b>5/8</b>  | 0.6250<br>15,8750      | 1.1875<br>30,1625      | 0.505<br>12,827      | 0.625<br>15,875      | 1.000<br>25,400 | 0.030<br>0,762       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254       | 8°30' |

## Designation system

Examples: SN04GXC Y2  
SN10Z

### Basic designation

### Bore code (multiples of 1/16 inch)

### Chamfer and groove

Z Chamfered outer ring  
G Grooved outer ring

### Starting torque

No code Standard  
X<sup>2)</sup> Reduced

### Surface treatment of outer ring

No code Not plated  
C<sup>1)</sup> Cadmium plated external dimensions  
J<sup>1)</sup> Zinc-nickel plated external dimensions

### Over-size

No code Standard outer diameter size  
Y1<sup>1)</sup> 0.005 in/0,127 mm oversized outer diameter  
Y2<sup>1)</sup> 0.010 in/0,254 mm oversized outer diameter  
Y3<sup>1)</sup> 0.015 in/0,381 mm oversized outer diameter  
Y4<sup>1)</sup> 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> Available only for bore code ≤ 16

## Loads and torques

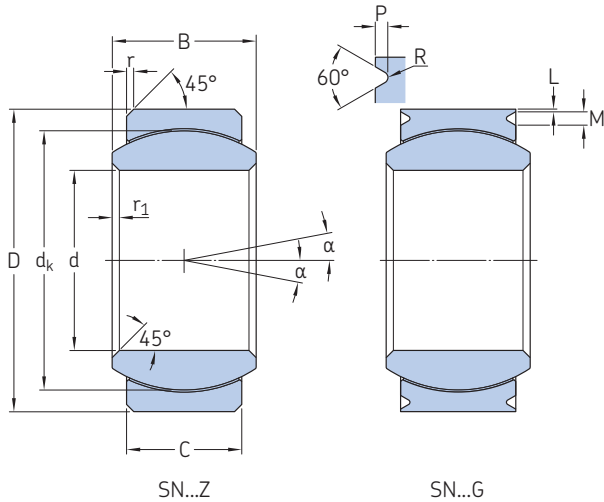
| Nominal bore code | Size | Mass<br>≈    | Static limit loads       |                                       | Radial dynamic load<br>C <sub>25</sub> | Starting torque<br>Standard | Reduced starting torque <sup>3)</sup><br>Max |
|-------------------|------|--------------|--------------------------|---------------------------------------|----------------------------------------|-----------------------------|----------------------------------------------|
|                   |      |              | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>4)</sup> |                                        |                             |                                              |
| –                 |      | lb/g         | lbf/kN                   |                                       |                                        | lbf-in/Nm                   |                                              |
| 03                | 3/16 | 0,02<br>9,1  | 3 975<br>17,68           | 500<br>2,22                           | 1 500<br>6,67                          | 0,5/3<br>0,06/0,34          | 0,5<br>0,06                                  |
| 04                | 1/4  | 0,02<br>9,1  | 6 040<br>26,87           | 750<br>3,34                           | 2 320<br>10,32                         | 1,0/5,0<br>0,11/0,56        | 1,0<br>0,11                                  |
| 05                | 5/16 | 0,03<br>13,6 | 8 750<br>38,92           | 1 000<br>4,45                         | 3 430<br>15,25                         | 1,0/5,0<br>0,11/0,56        | 1,0<br>0,11                                  |
| 06                | 3/8  | 0,04<br>18,1 | 10 540<br>46,88          | 1 400<br>6,23                         | 4 200<br>18,68                         | 1,0/5,0<br>0,11/0,56        | 1,0<br>0,11                                  |
| 07                | 7/16 | 0,05<br>22,7 | 13 200<br>58,72          | 1 800<br>8,01                         | 5 700<br>25,35                         | 1,0/5,0<br>0,11/0,56        | 1,0<br>0,11                                  |
| 08                | 1/2  | 0,07<br>31,8 | 17 900<br>79,62          | 2 700<br>12,01                        | 7 900<br>35,14                         | 1,0/5,0<br>0,11/0,56        | 1,0<br>0,11                                  |
| 09                | 9/16 | 0,09<br>40,8 | 23 200<br>103,20         | 3 680<br>16,37                        | 10 300<br>45,81                        | 1,0/5,0<br>0,11/0,56        | 1,0<br>0,11                                  |
| 10                | 5/8  | 0,12<br>54,4 | 30 500<br>135,67         | 4 750<br>21,13                        | 13 400<br>59,6                         | 1,0/5,0<br>0,11/0,56        | 1,0<br>0,11                                  |

<sup>3)</sup> The minimum starting torque is limited by zero radial and axial internal clearance

<sup>4)</sup> These values can be limited by the unstaking load (contact SKF for more information)

## 2.25 Self-lubricating narrow (inch dimensions)

SN... bore code **12** to **32**



|                                |                                                                  |
|--------------------------------|------------------------------------------------------------------|
| <b>Technical specification</b> | AS 8942                                                          |
| <b>Product standards</b>       | NSA 8134 (chamfered outer ring)<br>NSA 8136 (grooved outer ring) |
| <b>Materials</b>               |                                                                  |
| Liner                          | X1                                                               |
| Inner ring                     | Corrosion-resistant steel 440C                                   |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                 |

| Nominal bore code | L<br>+0.010/0<br>+0.254/0 | M<br>+0.010/0<br>+0.254/0 |
|-------------------|---------------------------|---------------------------|
| -                 | in/mm                     |                           |
| ≤ 04              | 0.010/0.254               | 0.035/0.889               |
| 05 to 07          | 0.020/0.508               | 0.045/1.143               |
| ≥ 08              | 0.020/0.508               | 0.070/1.778               |

### Dimensions

| Nominal bore code      | Size         | Dimensions             |                        | C                    | B                    | d <sub>k</sub>  | r                    | r <sub>1</sub>       | P                   | R                  | α     |
|------------------------|--------------|------------------------|------------------------|----------------------|----------------------|-----------------|----------------------|----------------------|---------------------|--------------------|-------|
|                        |              | d                      | D                      |                      |                      |                 |                      |                      |                     |                    |       |
|                        |              | 0/-0.0005<br>0/-0.0127 | 0/-0.0005<br>0/-0.0127 | 0/-0.010<br>0/-0.254 | 0/-0.002<br>0/-0.051 | ≈               | 0/-0.010<br>0/-0.254 | +0.010/0<br>+0.254/0 | 0.015/0<br>+0.381/0 | 0/0.010<br>0/0.254 | °     |
| -                      |              | in/mm                  |                        |                      |                      |                 |                      |                      |                     |                    | °     |
| <b>12</b>              | <b>3/4</b>   | 0.7500<br>19,0500      | 1.4375<br>36,5125      | 0.598<br>15,189      | 0.750<br>19,050      | 1.250<br>31,750 | 0.030<br>0,762       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254     | 8°30' |
| <b>14</b>              | <b>7/8</b>   | 0.8750<br>22,2250      | 1.5625<br>39,6875      | 0.708<br>17,983      | 0.875<br>22,225      | 1.375<br>34,925 | 0.040<br>1,016       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254     | 9     |
| <b>16</b>              | <b>1</b>     | 1.0000<br>25,4000      | 1.7500<br>44,4500      | 0.802<br>20,371      | 1.000<br>25,400      | 1.562<br>39,675 | 0.040<br>1,016       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254     | 9°30' |
| <b>20</b>              | <b>1 1/4</b> | 1.2500<br>31,7500      | 2.0000<br>50,8000      | 0.947<br>24,054      | 1.093<br>27,762      | 1.812<br>46,020 | 0.040<br>1,016       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254     | 6     |
| <b>24<sup>1)</sup></b> | <b>1 1/2</b> | 1.5000<br>38,1000      | 2.4375<br>61,9125      | 1.135<br>28,829      | 1.312<br>33,325      | 2.250<br>57,150 | 0.040<br>1,016       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254     | 6     |
| <b>28<sup>1)</sup></b> | <b>1 3/4</b> | 1.7500<br>44,4500      | 2.8125<br>71,4375      | 1.322<br>33,579      | 1.531<br>38,887      | 2.625<br>66,675 | 0.040<br>1,016       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254     | 6     |
| <b>28PR</b>            | <b>1 3/4</b> | 1.7500<br>44,4500      | 2.8750<br>73,0250      | 1.000<br>25,400      | 1.125<br>28,575      | 2.592<br>65,834 | 0.040<br>1,016       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254     | 4     |
| <b>32<sup>1)</sup></b> | <b>2</b>     | 2.0000<br>50,8000      | 3.1875<br>80,9625      | 1.510<br>38,354      | 1.750<br>44,450      | 3.000<br>76,200 | 0.040<br>1,016       | 0.005<br>0,127       | 0.045<br>1,143      | 0.010<br>0,254     | 6     |

<sup>1)</sup> SKF option



## Designation system

Examples: SN04GXC Y2  
SN10Z

SN 04 G X C Y2

### Basic designation

Bore code (multiples of 1/16 inch)

### Chamfer and groove

Z Chamfered outer ring  
G Grooved outer ring

### Starting torque

No code Standard  
X<sup>2)</sup> Reduced

### Surface treatment of outer ring

No code Not plated  
C<sup>1)</sup> Cadmium plated external dimensions  
J<sup>1)</sup> Zinc-nickel plated external dimensions

### Over-size

No code Standard outer diameter size  
Y1<sup>1)</sup> 0.005 in/0,127 mm oversized outer diameter  
Y2<sup>1)</sup> 0.010 in/0,254 mm oversized outer diameter  
Y3<sup>1)</sup> 0.015 in/0,381 mm oversized outer diameter  
Y4<sup>1)</sup> 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

<sup>2)</sup> Available only for bore code ≤ 16

## Loads and torques

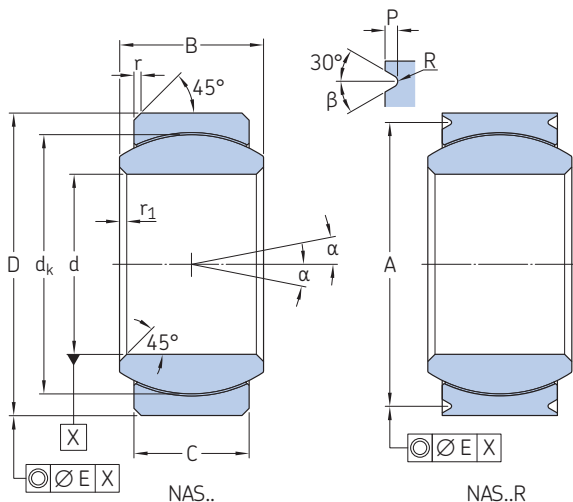
| Nominal bore code      | Size         | Mass ≈        | Static limit loads    |                                    | Radial dynamic load C <sub>25</sub> | Starting torque Standard | Reduced starting torque <sup>3)</sup> Max |
|------------------------|--------------|---------------|-----------------------|------------------------------------|-------------------------------------|--------------------------|-------------------------------------------|
|                        |              |               | Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>4)</sup> |                                     |                          |                                           |
| –                      |              | lb/g          | lbf/kN                |                                    |                                     | lbf-in/Nm                |                                           |
| <b>12</b>              | <b>3/4</b>   | 0.21<br>95,3  | 46 400<br>206,40      | 6 749<br>30,02                     | 19 700<br>87,63                     | 1.0/5.0<br>0,11/0,56     | 1.0<br>0,11                               |
| <b>14</b>              | <b>7/8</b>   | 0.27<br>122,5 | 62 200<br>276,68      | 9 350<br>41,59                     | 26 100<br>116,09                    | 2.0/8.0<br>0,23/0,90     | 2.0<br>0,23                               |
| <b>16</b>              | <b>1</b>     | 0.39<br>176,9 | 82 200<br>365,64      | 12 160<br>54,09                    | 34 100<br>151,68                    | 2.0/8.0<br>0,23/0,90     | 2.0<br>0,23                               |
| <b>20</b>              | <b>1 1/4</b> | 0.53<br>240,4 | 93 180<br>414,49      | 17 535<br>78,00                    | 45 022<br>200,27                    | 3.5/13.3<br>0,4/1,5      | –<br>–                                    |
| <b>24<sup>1)</sup></b> | <b>1 1/2</b> | 0.96<br>435,4 | 141 060<br>627,47     | 24 000<br>106,76                   | 71 607<br>318,52                    | 3.5/13.3<br>0,4/1,5      | –<br>–                                    |
| <b>28<sup>1)</sup></b> | <b>1 3/4</b> | 1.48<br>671,3 | 194 040<br>863,13     | 33 750<br>150,13                   | 72 406<br>318,08                    | 3.5/13.3<br>0,4/1,5      | –<br>–                                    |
| <b>28PR</b>            | <b>1 3/4</b> | 1.20<br>545,0 | 286 478<br>1 274,32   | 19 906<br>88,55                    | 65 120<br>289,67                    | 3.5/13.3<br>0,4/1,5      | –<br>–                                    |
| <b>32<sup>1)</sup></b> | <b>2</b>     | 2.10<br>952,5 | 255 600<br>1 136,97   | 44 500<br>197,95                   | 129 751<br>577,16                   | 3.5/13.3<br>0,4/1,5      | –<br>–                                    |

<sup>3)</sup> The minimum starting torque is limited by zero radial and axial internal clearance

<sup>4)</sup> These values can be limited by the unstaking load (contact SKF for more information)

## 2.26 Self-lubricating narrow (inch dimensions)

NAS.. (XRE.., 11HN.. or 11BN..) bore code **3** to **10**



|                                |                                                                  |
|--------------------------------|------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81820                                                         |
| <b>Product standards</b>       | AS 14101 (grooved outer ring)<br>AS 14104 (chamfered outer ring) |
| <b>Materials</b>               |                                                                  |
| Liner                          | X1                                                               |
| Inner ring                     | Corrosion-resistant steel 440C<br>or PH13.8                      |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                 |

| Nominal bore code | $\beta$ | E           |
|-------------------|---------|-------------|
| -                 | °       | in/mm       |
| ≤ 4               | 20      | 0.005/0,127 |
| ≥ 5               | 30      | 0.005/0,127 |

### Dimensions

| Nominal<br>bore<br>code | Size | Dimensions             |                        |                  |                      |                |                  |                      |                      |                      |             |                 |
|-------------------------|------|------------------------|------------------------|------------------|----------------------|----------------|------------------|----------------------|----------------------|----------------------|-------------|-----------------|
|                         |      | d                      | D                      | C                | B                    | d <sub>k</sub> | r <sub>1</sub>   | r                    | A                    | P                    | R           | α <sup>4)</sup> |
|                         |      | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | ±0.005<br>±0,127 | 0/-0.002<br>0/-0,051 | ≈              | ±0.005<br>±0,127 | +0.010/0<br>+0,254/0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |             |                 |
| —                       |      | in/mm                  |                        |                  |                      |                |                  |                      |                      |                      |             | °               |
| 3                       | 3/16 | 0.1900                 | 0.5625                 | 0.218            | 0.281                | 0.406          | 0.010            | 0.010                | 0.500                | 0.025                | 0.005/0.010 | 10              |
|                         |      | 4,826                  | 14,288                 | 5,537            | 7,137                | 10,312         | 0,254            | 0,254                | 12,700               | 0,635                | 0,127/0,254 |                 |
| 4                       | 1/4  | 0.2500                 | 0.6562                 | 0.250            | 0.343                | 0.500          | 0.010            | 0.010                | 0.594                | 0.025                | 0.005/0.010 | 10              |
|                         |      | 6,350                  | 16,667                 | 6,350            | 8,712                | 12,704         | 0,254            | 0,254                | 15,088               | 0,635                | 0,127/0,254 |                 |
| 5                       | 5/16 | 0.3125                 | 0.7500                 | 0.281            | 0.375                | 0.562          | 0.010            | 0.010                | 0.660                | 0.035                | 0.005/0.010 | 10              |
|                         |      | 7,938                  | 19,050                 | 7,137            | 9,525                | 14,283         | 0,254            | 0,254                | 16,764               | 0,889                | 0,127/0,254 |                 |
| 6                       | 3/8  | 0.3750                 | 0.8125                 | 0.312            | 0.406                | 0.625          | 0.010            | 0.020                | 0.712                | 0.035                | 0.010/0.017 | 9               |
|                         |      | 9,525                  | 20,638                 | 7,925            | 10,312               | 15,872         | 0,254            | 0,508                | 18,085               | 0,889                | 0,254/0,432 |                 |
| 7                       | 7/16 | 0.4375                 | 0.9062                 | 0.343            | 0.437                | 0.687          | 0.010            | 0.020                | 0.806                | 0.035                | 0.010/0.017 | 8               |
|                         |      | 11,113                 | 23,017                 | 8,712            | 11,100               | 17,448         | 0,254            | 0,508                | 20,472               | 0,889                | 0,254/0,432 |                 |
| 8                       | 1/2  | 0.5000                 | 1.0000                 | 0.390            | 0.500                | 0.781          | 0.010            | 0.020                | 0.876                | 0.055                | 0.010/0.017 | 8               |
|                         |      | 12,700                 | 25,400                 | 9,906            | 12,700               | 19,838         | 0,254            | 0,508                | 22,250               | 1,397                | 0,254/0,432 |                 |
| 9                       | 9/16 | 0.5625                 | 1.0937                 | 0.437            | 0.562                | 0.874          | 0.010            | 0.020                | 0.970                | 0.055                | 0.010/0.017 | 8               |
|                         |      | 14,288                 | 27,780                 | 11,100           | 14,275               | 22,212         | 0,254            | 0,508                | 24,638               | 1,397                | 0,254/0,432 |                 |
| 10                      | 5/8  | 0.6250                 | 1.1875                 | 0.500            | 0.625                | 0.968          | 0.010            | 0.020                | 1.063                | 0.055                | 0.010/0.017 | 8               |
|                         |      | 15,875                 | 30,163                 | 12,700           | 15,875               | 24,584         | 0,254            | 0,508                | 27,000               | 1,397                | 0,254/0,432 |                 |

### Loads and torque

| Nominal<br>bore<br>code | Size | Mass<br>≈ | Static limit loads       |                                        | Radial dynamic loads<br>C25 | Starting torque <sup>(4)</sup> |                            |                               |
|-------------------------|------|-----------|--------------------------|----------------------------------------|-----------------------------|--------------------------------|----------------------------|-------------------------------|
|                         |      |           | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>(2)</sup> |                             | Standard                       | Standard,<br>SKF precision | Reduced <sup>(3)</sup><br>max |
| –                       |      | lb/g      | lbf/kN                   |                                        | lbf-in/Nm                   |                                |                            |                               |
| 3                       | 3/16 | 0.02      | 3 975                    | 150                                    | 1 500                       | 0.25/5                         | 0.5/3                      | 0.5                           |
|                         |      | 9         | 17,69                    | 0,67                                   | 6,67                        | 0,03/0,56                      | 0,06/0,34                  | 0,06                          |
| 4                       | 1/4  | 0.02      | 6 040                    | 430                                    | 3 320                       | 0.25/5                         | 1/5                        | 0.5                           |
|                         |      | 9         | 26,88                    | 1,91                                   | 14,77                       | 0,03/0,56                      | 0,11/0,56                  | 0,06                          |
| 5                       | 5/16 | 0.03      | 8 750                    | 700                                    | 5 460                       | 0.25/8                         | 1/5                        | 1                             |
|                         |      | 14        | 38,94                    | 3,11                                   | 24,30                       | 0,03/0,90                      | 0,11/0,56                  | 0,11                          |
| 6                       | 3/8  | 0.04      | 10 540                   | 1 100                                  | 6 600                       | 0.25/8                         | 1/5                        | 1                             |
|                         |      | 18        | 46,90                    | 4,89                                   | 29,37                       | 0,03/0,90                      | 0,11/0,56                  | 0,11                          |
| 7                       | 7/16 | 0.05      | 13 200                   | 1 400                                  | 8 050                       | 0.25/8                         | 1/5                        | 1                             |
|                         |      | 22        | 58,74                    | 6,23                                   | 35,82                       | 0,03/0,90                      | 0,11/0,56                  | 0,11                          |
| 8                       | 1/2  | 0.07      | 17 900                   | 2 100                                  | 10 400                      | 0.25/8                         | 1/5                        | 1                             |
|                         |      | 31        | 79,65                    | 9,34                                   | 46,28                       | 0,03/0,90                      | 0,11/0,56                  | 0,11                          |
| 9                       | 9/16 | 0.09      | 23 200                   | 3 680                                  | 13 000                      | 0.25/8                         | 1/5                        | 1                             |
|                         |      | 40        | 103,24                   | 16,38                                  | 57,85                       | 0,03/0,90                      | 0,11/0,56                  | 0,11                          |
| 10                      | 5/8  | 0.12      | 30 500                   | 4 720                                  | 16 450                      | 0.25/8                         | 1/5                        | 1                             |
|                         |      | 54        | 135,72                   | 21,00                                  | 73,20                       | 0,03/0,90                      | 0,11/0,56                  | 0,11                          |

<sup>1)</sup> Parts are delivered and marked with SKF standard XRE.., 11HN.. (inner ring spherical surface coated) or 11BN.. references.

<sup>2)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149

# Cross-reference designation system to XRE.., 11HN.. or 11BN..

|                                                          |                                                                         |   |   |     |    |   |   |    |   |    |
|----------------------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|---|----|---|----|
| Examples:                                                | ZNAS12RXTTFY2                                                           | Z | E | NAS | 12 | R | X | TT | F | Y2 |
|                                                          | NAS 3PPD                                                                |   |   |     |    |   |   |    |   |    |
| <b>Surface treatment of outer ring</b>                   |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Not plated                                                              |   |   |     |    |   |   |    |   |    |
| <b>SZ</b>                                                | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |   |    |   |    |
| <b>Z</b>                                                 | Cadmium plated external dimensions                                      |   |   |     |    |   |   |    |   |    |
| <b>Inner ring material</b>                               |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | 440C                                                                    |   |   |     |    |   |   |    |   |    |
| <b>E</b>                                                 | PH13.8                                                                  |   |   |     |    |   |   |    |   |    |
| <b>Basic designation</b>                                 |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>Bore code (multiples of 1/16 inch)</b>                |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>Chamfer and groove</b>                                |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Chamfered outer ring                                                    |   |   |     |    |   |   |    |   |    |
| <b>R</b>                                                 | Grooved outer ring                                                      |   |   |     |    |   |   |    |   |    |
| <b>Starting torque</b>                                   |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Standard                                                                |   |   |     |    |   |   |    |   |    |
| <b>XS<sup>1)</sup></b>                                   | Standard, SKF precision                                                 |   |   |     |    |   |   |    |   |    |
| <b>X</b>                                                 | Reduced                                                                 |   |   |     |    |   |   |    |   |    |
| <b>Shield and seal</b>                                   |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | No shield and seal                                                      |   |   |     |    |   |   |    |   |    |
| <b>TT<sup>2)</sup></b>                                   | Sealed                                                                  |   |   |     |    |   |   |    |   |    |
| <b>PP<sup>2)</sup></b>                                   | Shielded                                                                |   |   |     |    |   |   |    |   |    |
| <b>Material and surface treatment of inner ring code</b> |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Passivated inner ring                                                   |   |   |     |    |   |   |    |   |    |
| <b>F<sup>1)</sup></b>                                    | Chromium plated sphere                                                  |   |   |     |    |   |   |    |   |    |
| <b>D<sup>1)</sup></b>                                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |   |    |   |    |
| <b>K<sup>1)</sup> 3)</b>                                 | XLHP coated sphere                                                      |   |   |     |    |   |   |    |   |    |
| <b>N<sup>1)</sup> 3)</b>                                 | XLNT coated sphere                                                      |   |   |     |    |   |   |    |   |    |
| <b>H<sup>1)</sup> 3)</b>                                 | XL coated sphere                                                        |   |   |     |    |   |   |    |   |    |
| <b>Oversize</b>                                          |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Standard outer diameter size                                            |   |   |     |    |   |   |    |   |    |
| <b>Y2</b>                                                | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |    |   |   |    |   |    |
| <b>Y4</b>                                                | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |    |   |   |    |   |    |

1) SKF option

2) SKF option, only available for d ≥ 5

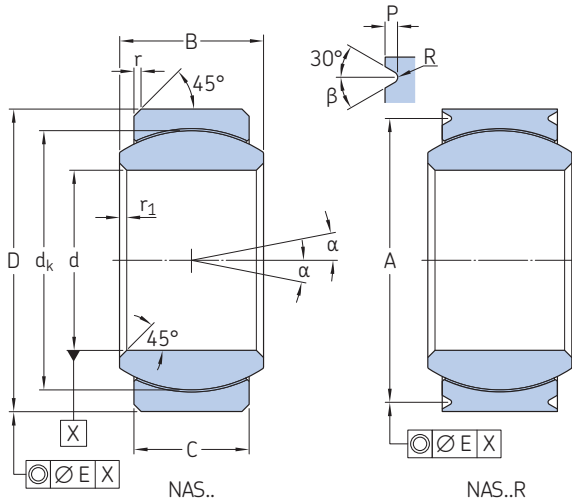
3) For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

3) If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

| Nominal bore code | Maximum radial clearance | Maximum axial clearance |
|-------------------|--------------------------|-------------------------|
| -                 | in/mm                    |                         |
| ≤ 12              | 0.0007/0,0178            | 0.0028/0,0711           |
| ≥ 14              | 0.0010/0,0254            | 0.0040/0,1016           |

## 2.26 Self-lubricating narrow (inch dimensions)

NAS.. (XRE.., 11HN.. or 11BN..) <sup>2)</sup> bore code **12** to **32**



|                                |                                                                  |
|--------------------------------|------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81820                                                         |
| <b>Product standards</b>       | AS 14101 (grooved outer ring)<br>AS 14104 (chamfered outer ring) |
| <b>Materials</b>               |                                                                  |
| Liner                          | X1                                                               |
| Inner ring                     | Corrosion-resistant steel 440C<br>or PH13.8                      |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                 |

| Nominal bore code | $\beta$ | E           |
|-------------------|---------|-------------|
| -                 | °       | in/mm       |
| $\leq 4$          | 20      | 0.005/0,127 |
| $\geq 5$          | 30      | 0.005/0,127 |

### Dimensions

| Nominal<br>bore<br>code | Size | Dimensions             |                        | C      | B      | d <sub>k</sub><br>≈ | r <sub>1</sub><br>±0.005<br>±0,127 | r<br>+0.010/0<br>+0,254/0 | A<br>0/-0.008<br>0/-0,203 | P<br>0/-0.010<br>0/-0,254 | R           | α <sup>4)</sup> |
|-------------------------|------|------------------------|------------------------|--------|--------|---------------------|------------------------------------|---------------------------|---------------------------|---------------------------|-------------|-----------------|
|                         |      | d                      | D                      |        |        |                     |                                    |                           |                           |                           |             |                 |
|                         |      | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 |        |        |                     |                                    |                           |                           |                           |             |                 |
| —                       |      | in/mm                  |                        |        |        |                     |                                    |                           |                           |                           |             | °               |
| 12                      | ¾    | 0.7500                 | 1.4375                 | 0.593  | 0.750  | 1.187               | 0.010                              | 0.030                     | 1.313                     | 0.055                     | 0.010/0.017 | 8               |
|                         |      | 19,050                 | 36,513                 | 15,062 | 19,050 | 30,149              | 0,254                              | 0,762                     | 33,350                    | 1,397                     | 0,254/0,432 |                 |
| 14                      | 7/8  | 0.8750                 | 1.5625                 | 0.703  | 0.875  | 1.314               | 0.010                              | 0.030                     | 1.438                     | 0.055                     | 0.010/0.017 | 8               |
|                         |      | 22,225                 | 39,688                 | 17,856 | 22,225 | 33,370              | 0,254                              | 0,762                     | 36,525                    | 1,397                     | 0,254/0,432 |                 |
| 16                      | 1    | 1.0000                 | 1.7500                 | 0.797  | 1.000  | 1.500               | 0.010                              | 0.030                     | 1.626                     | 0.055                     | 0.010/0.017 | 9               |
|                         |      | 25,400                 | 44,450                 | 20,244 | 25,400 | 38,099              | 0,254                              | 0,762                     | 41,300                    | 1,397                     | 0,254/0,432 |                 |
| 20 <sup>1)</sup>        | 1¼   | 1.2500                 | 2.0000                 | 0.937  | 1.093  | 1.812               | 0.010                              | 0.030                     | 1.878                     | 0.060                     | 0.010/0.020 | 6               |
|                         |      | 31,750                 | 50,800                 | 23,800 | 27,762 | 46,020              | 0,254                              | 0,762                     | 47,701                    | 1,524                     | 0,254/0,508 |                 |
| 24 <sup>1)</sup>        | 1½   | 1.5000                 | 2.4375                 | 1.135  | 1.312  | 2.284               | 0.010                              | 0.030                     | 2.317                     | 0.060                     | 0.010/0.020 | 6               |
|                         |      | 38,100                 | 61,913                 | 28,830 | 33,325 | 58,022              | 0,254                              | 0,762                     | 58,850                    | 1,524                     | 0,254/0,508 |                 |
| 28 <sup>1)</sup>        | 1¾   | 1.7500                 | 2.8750                 | 1.000  | 1.125  | 2.517               | 0.010                              | 0.030                     | 2.753                     | 0.060                     | 0.010/0.020 | 4               |
|                         |      | 44,450                 | 73,025                 | 25,400 | 28,575 | 63,941              | 0,254                              | 0,762                     | 69,930                    | 1,524                     | 0,254/0,508 |                 |
| 32 <sup>1)</sup>        | 2    | 2.0000                 | 3.1875                 | 1.510  | 1.750  | 3.000               | 0.010                              | 0.040                     | 3.064                     | 0.060                     | 0.010/0.020 | 6               |
|                         |      | 50,800                 | 80,963                 | 38,354 | 44,450 | 76,200              | 0,254                              | 1,016                     | 77,826                    | 1,524                     | 0,254/0,508 |                 |

### Loads and torque

| Nominal bore code      | Size         | Mass $\approx$ | Static limit loads  | Axial $C_{a3)}$  | Radial dynamic load C <sub>25</sub> | Starting torque <sup>4)</sup> | Standard, SKF precision | Reduced <sup>4)</sup> max |
|------------------------|--------------|----------------|---------------------|------------------|-------------------------------------|-------------------------------|-------------------------|---------------------------|
|                        |              | lb/g           | lbf/kN              |                  |                                     | lbf-in/Nm                     |                         |                           |
| <b>12</b>              | <b>3/4</b>   | 0.21<br>95     | 46 400<br>206,48    | 6 750<br>30,03   | 23 600<br>105,02                    | 0.25/8<br>0,03/0,90           | 1/5<br>0,11/0,56        | 1<br>0,11                 |
| <b>14</b>              | <b>7/8</b>   | 0.27<br>122    | 62 200<br>276,79    | 9 350<br>41,60   | 30 250<br>134,61                    | 0.25/12<br>0,03/1,36          | 2/8<br>0,23/0,9         | 2<br>0,23                 |
| <b>16</b>              | <b>1</b>     | 0.39<br>176    | 82 200<br>365,79    | 12 160<br>54,11  | 38 000<br>169,10                    | 0.25/12<br>0,03/1,36          | 2/8<br>0,23/0,9         | 2<br>0,23                 |
| <b>20<sup>1)</sup></b> | <b>1 1/4</b> | 0.53<br>240    | 91 011<br>405,00    | 17 528<br>78,00  | 45 025<br>200,27                    | 2/20<br>0,23/2,26             | 2.5/13<br>0,28/1,47     | 2.2<br>0,25               |
| <b>24<sup>1)</sup></b> | <b>1 1/2</b> | 0.89<br>405    | 139 363<br>619,39   | 26 339<br>117,06 | 72 410<br>322,08                    | 2/20<br>0,23/2,26             | 2.5/15.5<br>0,28/1,75   | 2.5<br>0,28               |
| <b>28<sup>1)</sup></b> | <b>1 3/4</b> | 1.20<br>545    | 127 432<br>567,07   | 19 924<br>88,55  | 65 124<br>289,67                    | 10/35<br>1,3/3,9              | 4.5/19<br>0,5/2,15      | 4.5<br>0,5                |
| <b>32<sup>1)</sup></b> | <b>2</b>     | 2.10<br>953    | 298 200<br>1 326,46 | 51 905<br>230,88 | 144 579<br>643,12                   | 10/35<br>1,3/3,9              | 10.0/35.0<br>1,3/3,9    | 4.5<br>0,5                |

<sup>1)</sup> SKF option <sup>2)</sup> Parts are delivered and marked with SKF standard XRE.., 11HN.. (inner ring spherical surface coated) or 11BN.. references.

<sup>3)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



### Cross-reference designation system to XRE..., 11HN... or 11BN...

| Examples:                                                | ZNAS12RXTTFY2                                                           | Z | E | NAS | 12 | R | X | TT | F | Y2 |
|----------------------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|---|----|---|----|
|                                                          | NAS 3PPD                                                                |   |   |     |    |   |   |    |   |    |
| <b>Surface treatment of outer ring</b>                   |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Not plated                                                              |   |   |     |    |   |   |    |   |    |
| <b>SZ</b>                                                | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |   |    |   |    |
| <b>Z</b>                                                 | Cadmium plated external dimensions                                      |   |   |     |    |   |   |    |   |    |
| <b>Inner ring material</b>                               |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | 440C                                                                    |   |   |     |    |   |   |    |   |    |
| <b>E</b>                                                 | PH13.8                                                                  |   |   |     |    |   |   |    |   |    |
| <b>Basic designation</b>                                 |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>Bore code (multiples of 1/16 inch)</b>                |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>Chamfer and groove</b>                                |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Chamfered outer ring                                                    |   |   |     |    |   |   |    |   |    |
| <b>R</b>                                                 | Grooved outer ring                                                      |   |   |     |    |   |   |    |   |    |
| <b>Starting torque</b>                                   |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Standard                                                                |   |   |     |    |   |   |    |   |    |
| <b>XS<sup>1)</sup></b>                                   | Standard, SKF precision                                                 |   |   |     |    |   |   |    |   |    |
| <b>X</b>                                                 | Reduced                                                                 |   |   |     |    |   |   |    |   |    |
| <b>Shield and seal</b>                                   |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | No shield and seal                                                      |   |   |     |    |   |   |    |   |    |
| <b>TT<sup>2)</sup></b>                                   | Sealed                                                                  |   |   |     |    |   |   |    |   |    |
| <b>PP<sup>2)</sup></b>                                   | Shielded                                                                |   |   |     |    |   |   |    |   |    |
| <b>Material and surface treatment of inner ring code</b> |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Passivated inner ring                                                   |   |   |     |    |   |   |    |   |    |
| <b>F<sup>1)</sup></b>                                    | Chromium plated sphere                                                  |   |   |     |    |   |   |    |   |    |
| <b>D<sup>1)</sup></b>                                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |   |    |   |    |
| <b>K<sup>1) 3)</sup></b>                                 | XLHP coated sphere                                                      |   |   |     |    |   |   |    |   |    |
| <b>N<sup>1) 3)</sup></b>                                 | XLNT coated sphere                                                      |   |   |     |    |   |   |    |   |    |
| <b>H<sup>1) 3)</sup></b>                                 | XL coated sphere                                                        |   |   |     |    |   |   |    |   |    |
| <b>Oversize</b>                                          |                                                                         |   |   |     |    |   |   |    |   |    |
| <b>No code</b>                                           | Standard outer diameter size                                            |   |   |     |    |   |   |    |   |    |
| <b>Y2</b>                                                | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |    |   |   |    |   |    |
| <b>Y4</b>                                                | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |    |   |   |    |   |    |

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, only available for  $d \geq 5$

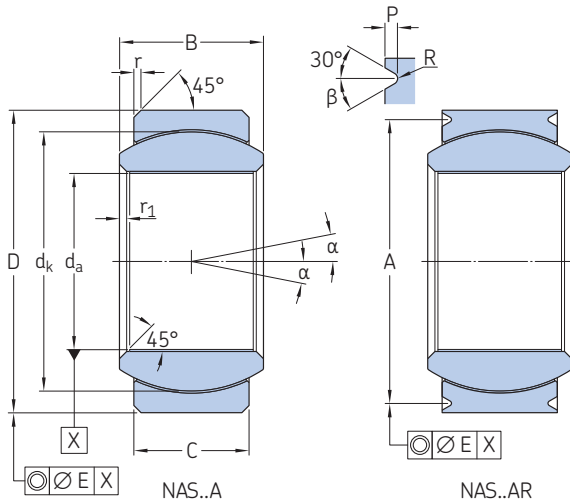
<sup>3)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

<sup>4)</sup> If starting torque is  $\leq 0.1$  lbf-in (0,01 Nm), maximum internal clearance must be:

| Nominal bore code | Maximum radial clearance | Maximum axial clearance |
|-------------------|--------------------------|-------------------------|
| -                 | in/mm                    |                         |
| $\leq 12$         | 0.0007/0,0178            | 0.0028/0,0711           |
| $\geq 14$         | 0.0010/0,0254            | 0.0040/0,1016           |

## 2.27 Self-lubricating narrow (inch dimensions)

NAS..A (XRE..A., 11LHN.. or 11LBN..) <sup>2)</sup> bore code 3 to 9



|                                |                                                                                                    |
|--------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81820                                                                                           |
| <b>Product standards</b>       | AS 81820/1 (lined bore and grooved outer ring)<br>AS 81820/4 (lined bore and chamfered outer ring) |
| <b>Materials</b>               |                                                                                                    |
| Liner                          | X1                                                                                                 |
| Inner ring                     | Passivated corrosion-resistant steel<br>440C or PH13.8                                             |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                                                   |

| Nominal bore code | β   | E           |
|-------------------|-----|-------------|
| -                 | °   | in/mm       |
| ≤ 5               | 20° | 0.006/0,152 |
| ≥ 6               | 30° | 0.006/0,152 |

### Dimensions

| Nominal bore code | Size | Dimensions       | D                      | C                      | B                | d <sub>k</sub>       | r <sub>1</sub> | r                    | A                    | P                    | R                          | α <sup>4)</sup> |
|-------------------|------|------------------|------------------------|------------------------|------------------|----------------------|----------------|----------------------|----------------------|----------------------|----------------------------|-----------------|
|                   |      | d <sub>a</sub>   | 0/-0.0010<br>0/-0,0254 | 0/-0.0005<br>0/-0,0127 | ±0.005<br>±0,127 | 0/-0.002<br>0/-0,051 | ≈              | +0.010/0<br>+0,254/0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |                            |                 |
| -                 |      | in/mm            |                        |                        |                  |                      |                |                      |                      |                      |                            | °               |
| 3 <sup>1)</sup>   | 3/16 | 0.1910<br>4,851  | 0.5625<br>14,288       | 0.218<br>5,537         | 0.281<br>7,137   | 0.406<br>10,312      | 0.005<br>0,127 | 0.010<br>0,254       | 0.500<br>12,700      | 0.025<br>0,635       | 0.005/0.010<br>0,127/0,254 | 10              |
| 4                 | 1/4  | 0.2510<br>6,375  | 0.6562<br>16,667       | 0.250<br>6,350         | 0.343<br>8,712   | 0.500<br>12,704      | 0.005<br>0,127 | 0.010<br>0,254       | 0.594<br>15,088      | 0.025<br>0,635       | 0.005/0.010<br>0,127/0,254 | 10              |
| 5                 | 5/16 | 0.3135<br>7,963  | 0.7500<br>19,050       | 0.281<br>7,137         | 0.375<br>9,525   | 0.562<br>14,283      | 0.005<br>0,127 | 0.010<br>0,254       | 0.660<br>16,764      | 0.035<br>0,889       | 0.005/0.010<br>0,127/0,254 | 10              |
| 6                 | 3/8  | 0.3760<br>9,550  | 0.8125<br>20,638       | 0.312<br>7,925         | 0.406<br>10,312  | 0.625<br>15,872      | 0.005<br>0,127 | 0.020<br>0,508       | 0.712<br>18,085      | 0.035<br>0,889       | 0.010/0.017<br>0,254/0,432 | 9               |
| 7                 | 7/16 | 0.4385<br>11,138 | 0.9062<br>23,017       | 0.343<br>8,712         | 0.437<br>11,100  | 0.687<br>17,448      | 0.005<br>0,127 | 0.020<br>0,508       | 0.806<br>20,472      | 0.035<br>0,889       | 0.010/0.017<br>0,254/0,432 | 8               |
| 8                 | 1/2  | 0.5010<br>12,725 | 1.0000<br>25,400       | 0.390<br>9,906         | 0.500<br>12,700  | 0.781<br>19,838      | 0.005<br>0,127 | 0.020<br>0,508       | 0.876<br>22,250      | 0.055<br>1,397       | 0.010/0.017<br>0,254/0,432 | 8               |
| 9                 | 9/16 | 0.5635<br>14,313 | 1.0937<br>27,780       | 0.437<br>11,100        | 0.562<br>14,275  | 0.874<br>22,212      | 0.005<br>0,127 | 0.020<br>0,508       | 0.970<br>24,638      | 0.055<br>1,397       | 0.010/0.017<br>0,254/0,432 | 8               |

### Loads and torque

| Nominal bore code | Size | Mass       | Static limit loads    | Radial dynamic load                | Starting torque <sup>4)</sup> | Standard, SKF precision | Reduced <sup>4)</sup> Max |
|-------------------|------|------------|-----------------------|------------------------------------|-------------------------------|-------------------------|---------------------------|
|                   |      | ≈          | Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>3)</sup> | C25                           | Standard                |                           |
| -                 |      | lb/g       | lbf/kN                |                                    |                               | lbf-in/Nm               |                           |
| 3 <sup>1)</sup>   | 3/16 | 0.02<br>9  | 3 975<br>17,69        | 150<br>0,67                        | 1 500<br>6,67                 | 1/5<br>0,11/0,56        | 0.5<br>0,06               |
| 4                 | 1/4  | 0.02<br>9  | 6 040<br>26,88        | 430<br>1,91                        | 3 320<br>14,77                | 1/15<br>0,11/1,69       | 0.5<br>0,06               |
| 5                 | 5/16 | 0.03<br>14 | 8 750<br>38,94        | 700<br>3,11                        | 5 460<br>24,30                | 1/15<br>0,11/1,69       | 1<br>0,11                 |
| 6                 | 3/8  | 0.04<br>18 | 10 540<br>46,90       | 1 100<br>4,89                      | 6 600<br>29,37                | 1/15<br>0,11/1,69       | 1<br>0,11                 |
| 7                 | 7/16 | 0.05<br>22 | 13 200<br>58,74       | 1 400<br>6,23                      | 8 050<br>35,82                | 1/15<br>0,11/1,69       | 1<br>0,11                 |
| 8                 | 1/2  | 0.07<br>31 | 17 900<br>79,65       | 2 100<br>9,34                      | 10 400<br>46,28               | 1/15<br>0,11/1,69       | 1<br>0,11                 |
| 9                 | 9/16 | 0.09<br>40 | 23 200<br>103,24      | 3 680<br>16,38                     | 13 000<br>57,85               | 1/15<br>0,11/1,69       | 1<br>0,11                 |

<sup>1)</sup> SKF option <sup>2)</sup> Parts are delivered and marked with SKF standard XRE..A., 11LHN (inner ring spherical surface coated) or 11LBN.. references.

<sup>3)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149

# Cross-reference designation system to XRE..A, 11LHN.. or 11LBN..

|                                                          |                                                                         |   |   |     |    |   |   |   |    |   |    |
|----------------------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|---|---|----|---|----|
| Examples:                                                | ZNAS12ARXTTFY2                                                          | Z | E | NAS | 12 | A | R | X | TT | F | Y2 |
|                                                          | NAS 3APPD                                                               |   |   |     |    |   |   |   |    |   |    |
| <b>Surface treatment of outer ring</b>                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Not plated                                                              |   |   |     |    |   |   |   |    |   |    |
| <b>Z</b>                                                 | Cadmium plated external dimensions                                      |   |   |     |    |   |   |   |    |   |    |
| <b>SZ</b>                                                | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |   |   |    |   |    |
| <b>Inner ring material</b>                               |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | 440C                                                                    |   |   |     |    |   |   |   |    |   |    |
| <b>E</b>                                                 | PH13.8                                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>Basic designation</b>                                 |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>Bore code</b> (multiples of 1/16 inch)                |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>Chamfer and groove</b>                                |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Chamfered outer ring                                                    |   |   |     |    |   |   |   |    |   |    |
| <b>R</b>                                                 | Grooved outer ring                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>Starting torque</b>                                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Standard                                                                |   |   |     |    |   |   |   |    |   |    |
| <b>XS<sup>1)</sup></b>                                   | Standard, SKF precision                                                 |   |   |     |    |   |   |   |    |   |    |
| <b>X</b>                                                 | Reduced                                                                 |   |   |     |    |   |   |   |    |   |    |
| <b>Shield and seal</b>                                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | No shield and seal                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>TT<sup>2)</sup></b>                                   | Sealed                                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>PP<sup>2)</sup></b>                                   | Shielded                                                                |   |   |     |    |   |   |   |    |   |    |
| <b>Material and surface treatment of inner ring code</b> |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Passivated inner ring                                                   |   |   |     |    |   |   |   |    |   |    |
| <b>F<sup>1)</sup></b>                                    | Chromium plated sphere                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>D<sup>1)</sup></b>                                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |   |   |    |   |    |
| <b>K<sup>1)</sup> 3)</b>                                 | XLHP coated sphere                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>N<sup>1)</sup> 3)</b>                                 | XLNT coated sphere                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>H<sup>1)</sup> 3)</b>                                 | XL coated sphere                                                        |   |   |     |    |   |   |   |    |   |    |
| <b>Oversize</b>                                          |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Standard outer diameter size                                            |   |   |     |    |   |   |   |    |   |    |
| <b>Y2</b>                                                | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |    |   |   |   |    |   |    |
| <b>Y4</b>                                                | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |    |   |   |   |    |   |    |

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, only available for d ≥ 5

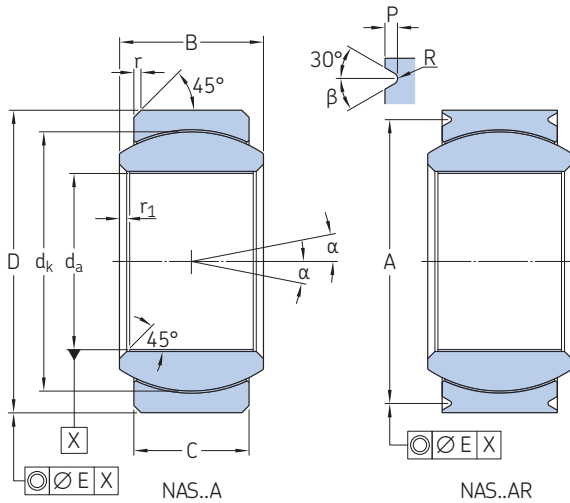
<sup>3)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

<sup>4)</sup> If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

| Nominal bore code | Maximum radial clearance | Maximum axial clearance |
|-------------------|--------------------------|-------------------------|
| -                 | in/mm                    |                         |
| ≤ 12              | 0,0007/0,0178            | 0,0028/0,0711           |
| ≥ 14              | 0,0010/0,0254            | 0,0040/0,1016           |

## 2.27 Self-lubricating narrow (inch dimensions)

NAS..A (XRE..A., 11LHN.. or 11LBN..) bore code **10** to **32**



|                                |                                                                                                    |
|--------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81820                                                                                           |
| <b>Product standards</b>       | AS 81820/1 (lined bore and grooved outer ring)<br>AS 81820/4 (lined bore and chamfered outer ring) |
| <b>Materials</b>               |                                                                                                    |
| Liner                          | X1                                                                                                 |
| Inner ring                     | Passivated corrosion-resistant steel<br>440C or PH13.8                                             |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                                                   |

| Nominal bore code | β   | E           |
|-------------------|-----|-------------|
| -                 | °   | in/mm       |
| ≤ 5               | 20° | 0.006/0,152 |
| ≥ 6               | 30° | 0.006/0,152 |

### Dimensions

| Nominal<br>bore<br>code | Size  | Dimensions             |                        |                  |                      |                |                |                      |                      |                      |             |                 |
|-------------------------|-------|------------------------|------------------------|------------------|----------------------|----------------|----------------|----------------------|----------------------|----------------------|-------------|-----------------|
|                         |       | d <sub>a</sub>         | D                      | C                | B                    | d <sub>k</sub> | r <sub>1</sub> | r                    | A                    | P                    | R           | α <sup>4)</sup> |
|                         |       | 0/-0.0010<br>0/-0,0254 | 0/-0.0005<br>0/-0,0127 | ±0.005<br>±0,127 | 0/-0.002<br>0/-0,051 | ≈              | max            | +0.010/0<br>+0,254/0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |             |                 |
| —                       |       | in/mm                  |                        |                  |                      |                |                |                      |                      |                      |             | °               |
| 10                      | 5/8   | 0.6260                 | 1.1875                 | 0.500            | 0.625                | 0.968          | 0.005          | 0.020                | 1.063                | 0.055                | 0.010/0.017 | 8               |
|                         |       | 15,900                 | 30,163                 | 12,700           | 15,875               | 24,584         | 0,127          | 0,508                | 27,000               | 1,397                | 0,254/0,432 |                 |
| 12                      | 3/4   | 0.7510                 | 1.4375                 | 0.593            | 0.750                | 1.187          | 0.005          | 0.030                | 1.313                | 0.055                | 0.010/0.017 | 8               |
|                         |       | 19,075                 | 36,513                 | 15,062           | 19,050               | 30,149         | 0,127          | 0,762                | 33,350               | 1,397                | 0,254/0,432 |                 |
| 14                      | 7/8   | 0.8760                 | 1.5625                 | 0.703            | 0.875                | 1.314          | 0.005          | 0.030                | 1.438                | 0.055                | 0.010/0.017 | 8               |
|                         |       | 22,250                 | 39,688                 | 17,856           | 22,225               | 33,370         | 0,127          | 0,762                | 36,525               | 1,397                | 0,254/0,432 |                 |
| 16                      | 1     | 1.0010                 | 1.7500                 | 0.797            | 1.000                | 1.500          | 0.005          | 0.030                | 1.626                | 0.055                | 0.010/0.017 | 9               |
|                         |       | 25,425                 | 44,450                 | 20,244           | 25,400               | 38,099         | 0,127          | 0,762                | 41,300               | 1,397                | 0,254/0,432 |                 |
| 20 <sup>1)</sup>        | 1 1/4 | 1.2510                 | 2.0000                 | 0.937            | 1.093                | 1.812          | 0.005          | 0.030                | 1.878                | 0.060                | 0.010/0.020 | 6               |
|                         |       | 31,775                 | 50,800                 | 23,800           | 27,762               | 46,020         | 0,127          | 0,762                | 47,701               | 1,524                | 0,254/0,508 |                 |
| 24 <sup>1)</sup>        | 1 1/2 | 1.5010                 | 2.4375                 | 1.135            | 1.312                | 2.284          | 0.005          | 0.030                | 2.317                | 0.060                | 0.010/0.020 | 6               |
|                         |       | 38,125                 | 61,913                 | 28,830           | 33,325               | 58,022         | 0,127          | 0,762                | 58,850               | 1,524                | 0,254/0,508 |                 |
| 28 <sup>1)</sup>        | 1 3/4 | 1.7510                 | 2.8750                 | 1.000            | 1.125                | 2.517          | 0.005          | 0.030                | 2.753                | 0.060                | 0.010/0.020 | 4               |
|                         |       | 44,475                 | 73,025                 | 25,400           | 28,575               | 63,941         | 0,127          | 0,762                | 69,930               | 1,524                | 0,254/0,508 |                 |
| 32 <sup>1)</sup>        | 2     | 2.0010                 | 3.1875                 | 1.510            | 1.750                | 3.000          | 0.005          | 0.040                | 3.064                | 0.060                | 0.010/0.020 | 6               |
|                         |       | 50,825                 | 80,963                 | 38,354           | 44,450               | 76,200         | 0,127          | 1,016                | 77,826               | 1,524                | 0,254/0,508 |                 |

### Loads and torque

| Nominal bore code      | Size         | Mass        | Static limit loads    | Radial dynamic load                | Starting torque <sup>4)</sup> | Standard          | Standard, SKF precision | Reduced <sup>4)</sup> Max |
|------------------------|--------------|-------------|-----------------------|------------------------------------|-------------------------------|-------------------|-------------------------|---------------------------|
|                        |              | ≈           |                       | C25                                |                               |                   |                         |                           |
|                        |              | lb/g        | Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>3)</sup> |                               | lb-in/Nm          |                         |                           |
| <b>10</b>              | <b>5/8</b>   | 0.12<br>54  | 30 500<br>135,72      | 4 720<br>21,00                     | 16 450<br>73,20               | 1/15<br>0,11/1,69 | 1/5<br>0,11/0,56        | 1<br>0,11                 |
| <b>12</b>              | <b>3/4</b>   | 0.21<br>95  | 46 400<br>206,48      | 6 750<br>30,03                     | 23 600<br>105,02              | 1/15<br>0,11/1,69 | 1/5<br>0,11/0,56        | 1<br>0,11                 |
| <b>14</b>              | <b>7/8</b>   | 0.27<br>122 | 62 200<br>276,79      | 9 350<br>41,60                     | 30 250<br>134,61              | 1/25<br>0,11/2,82 | 2/8<br>0,23/0,9         | 2<br>0,23                 |
| <b>16</b>              | <b>1</b>     | 0.39<br>176 | 82 200<br>365,79      | 12 160<br>54,11                    | 38 000<br>169,10              | 1/25<br>0,11/2,82 | 2/8<br>0,23/0,9         | 2<br>0,23                 |
| <b>20<sup>1)</sup></b> | <b>1 1/4</b> | 0.53<br>240 | 91 011<br>405,00      | 17 528<br>78,00                    | 45 025<br>200,27              | 2/20<br>0,23/2,26 | 2.5/13<br>0,28/1,47     | 2.2<br>0,25               |
| <b>24<sup>1)</sup></b> | <b>1 1/2</b> | 0.89<br>405 | 139 363<br>619,39     | 26 339<br>117,06                   | 72 410<br>322,08              | 2/20<br>0,23/2,26 | 2.5/15.5<br>0,28/1,75   | 2.5<br>0,28               |
| <b>28<sup>1)</sup></b> | <b>1 3/4</b> | 1.20<br>545 | 127 432<br>567,07     | 19 924<br>88,55                    | 65 124<br>289,67              | 10/35<br>1,3/3,9  | 4.5/19<br>0,5/2,15      | 4.5<br>0,5                |
| <b>32<sup>1)</sup></b> | <b>2</b>     | 2.10<br>953 | 298 200<br>1 326,46   | 51 905<br>230,88                   | 144 579<br>643,12             | 10/35<br>1,3/3,9  | 10.0/35.0<br>1,3/3,9    | 4.5<br>0,5                |

<sup>1)</sup> SKF option <sup>2)</sup> Parts are delivered and marked with SKF standard XRE..A., 11LHN (inner ring spherical surface coated) or 11LBN.. references.

<sup>3)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



**Cross-reference designation system to XRE..A, 11LHN.. or 11LBN..**

|                                                          |                                                                         |   |   |     |    |   |   |   |    |   |    |
|----------------------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|---|---|----|---|----|
| Examples:                                                | ZNAS12ARXTTFY2                                                          | Z | E | NAS | 12 | A | R | X | TT | F | Y2 |
|                                                          | NAS 3APPD                                                               |   |   |     |    |   |   |   |    |   |    |
| <b>Surface treatment of outer ring</b>                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| No code                                                  | Not plated                                                              |   |   |     |    |   |   |   |    |   |    |
| Z                                                        | Cadmium plated external dimensions                                      |   |   |     |    |   |   |   |    |   |    |
| SZ                                                       | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |   |   |    |   |    |
| <b>Inner ring material</b>                               |                                                                         |   |   |     |    |   |   |   |    |   |    |
| No code                                                  | 440C                                                                    |   |   |     |    |   |   |   |    |   |    |
| E                                                        | PH13.8                                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>Basic designation</b>                                 |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>Bore code</b> (multiples of 1/16 inch)                |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>Chamfer and groove</b>                                |                                                                         |   |   |     |    |   |   |   |    |   |    |
| No code                                                  | Chamfered outer ring                                                    |   |   |     |    |   |   |   |    |   |    |
| R                                                        | Grooved outer ring                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>Starting torque</b>                                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| No code                                                  | Standard                                                                |   |   |     |    |   |   |   |    |   |    |
| XS <sup>1)</sup>                                         | Standard, SKF precision                                                 |   |   |     |    |   |   |   |    |   |    |
| X                                                        | Reduced                                                                 |   |   |     |    |   |   |   |    |   |    |
| <b>Shield and seal</b>                                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| No code                                                  | No shield and seal                                                      |   |   |     |    |   |   |   |    |   |    |
| TT <sup>2)</sup>                                         | Sealed                                                                  |   |   |     |    |   |   |   |    |   |    |
| PP <sup>2)</sup>                                         | Shielded                                                                |   |   |     |    |   |   |   |    |   |    |
| <b>Material and surface treatment of inner ring code</b> |                                                                         |   |   |     |    |   |   |   |    |   |    |
| No code                                                  | Passivated inner ring                                                   |   |   |     |    |   |   |   |    |   |    |
| F <sup>1)</sup>                                          | Chromium plated sphere                                                  |   |   |     |    |   |   |   |    |   |    |
| D <sup>1)</sup>                                          | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |   |   |    |   |    |
| K <sup>1) 3)</sup>                                       | XLHP coated sphere                                                      |   |   |     |    |   |   |   |    |   |    |
| N <sup>1) 3)</sup>                                       | XLNT coated sphere                                                      |   |   |     |    |   |   |   |    |   |    |
| H <sup>1) 3)</sup>                                       | XL coated sphere                                                        |   |   |     |    |   |   |   |    |   |    |
| <b>Oversize</b>                                          |                                                                         |   |   |     |    |   |   |   |    |   |    |
| No code                                                  | Standard outer diameter size                                            |   |   |     |    |   |   |   |    |   |    |
| Y2                                                       | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |    |   |   |   |    |   |    |
| Y4                                                       | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |    |   |   |   |    |   |    |

1) SKF option

2) SKF option, only available for  $d \geq 5$

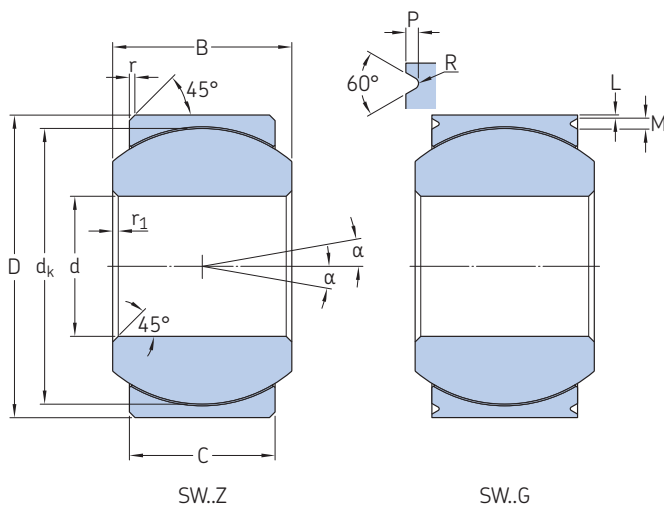
3) For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

4) If starting torque is  $\leq 0.1$  lbf-in (0,01 Nm), maximum internal clearance must be:

| Nominal bore code | Maximum radial clearance | Maximum axial clearance |
|-------------------|--------------------------|-------------------------|
| -                 | in/mm                    |                         |
| $\leq 12$         | 0,0007/0,0178            | 0,0028/0,0711           |
| $\geq 14$         | 0,0010/0,0254            | 0,0040/0,1016           |

## 2.28 Self-lubricating wide (inch dimensions)

SW... bore code **03** to **10**



|                                |                                                                  |
|--------------------------------|------------------------------------------------------------------|
| <b>Technical specification</b> | AS 8942                                                          |
| <b>Product standards</b>       | NSA 8135 (chamfered outer ring)<br>NSA 8137 (grooved outer ring) |
| <b>Materials</b>               |                                                                  |
| Liner                          | X1                                                               |
| Inner ring                     | Corrosion-resistant steel 440C                                   |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                 |

|                          |                      |                      |
|--------------------------|----------------------|----------------------|
| <b>Nominal bore code</b> | <b>L</b>             | <b>M</b>             |
|                          | +0.010/0<br>+0.254/0 | +0.010/0<br>+0.254/0 |

in/mm

|          |             |             |
|----------|-------------|-------------|
| ≤ 05     | 0.010/0,254 | 0.035/0,889 |
| 06 to 10 | 0.020/0,508 | 0.045/1,143 |
| ≥ 12     | 0.020/0,508 | 0.070/1,778 |

### Dimensions

| Nominal<br>bore<br>code | Size | Dimensions             |                        |                      |                      |                 |                      |                      |                      |                      | α  |
|-------------------------|------|------------------------|------------------------|----------------------|----------------------|-----------------|----------------------|----------------------|----------------------|----------------------|----|
|                         |      | d                      | D                      | C                    | B                    | d <sub>k</sub>  | r                    | r <sub>1</sub>       | P                    | R                    |    |
|                         |      | 0/−0.0005<br>0/−0,0127 | 0/−0.0005<br>0/−0,0127 | 0/−0.010<br>0/−0,254 | 0/−0.002<br>0/−0,051 | ≈               | +0.010/0<br>+0,254/0 | +0.010/0<br>+0,254/0 | +0.015/0<br>+0,381/0 | +0.010/0<br>+0,254/0 |    |
| –                       |      | in/mm                  |                        |                      |                      |                 |                      |                      |                      |                      | °  |
| 03                      | 3/16 | 0.1900<br>4,8260       | 0.6250<br>15,8750      | 0.332<br>8,433       | 0.437<br>11,100      | 0.531<br>13,487 | 0.015<br>0,381       | 0.005<br>0,127       | 0.015<br>0,381       | 0.005<br>0,127       | 17 |
| 04                      | 1/4  | 0.2500<br>6,3500       | 0.6250<br>15,8750      | 0.332<br>8,433       | 0.437<br>11,100      | 0.531<br>13,487 | 0.015<br>0,381       | 0.005<br>0,127       | 0.015<br>0,381       | 0.005<br>0,127       | 17 |
| 05                      | 5/16 | 0.3125<br>7,9375       | 0.6875<br>17,4625      | 0.322<br>8,179       | 0.437<br>11,100      | 0.593<br>15,062 | 0.015<br>0,381       | 0.005<br>0,127       | 0.015<br>0,381       | 0.005<br>0,127       | 14 |
| 06                      | 3/8  | 0.3750<br>9,5250       | 0.8125<br>20,6375      | 0.411<br>10,439      | 0.500<br>12,700      | 0.687<br>17,450 | 0.015<br>0,381       | 0.005<br>0,127       | 0.025<br>0,635       | 0.010<br>0,254       | 10 |
| 07                      | 7/16 | 0.4375<br>11,1125      | 0.9375<br>23,8125      | 0.447<br>11,354      | 0.562<br>14,275      | 0.781<br>19,837 | 0.015<br>0,381       | 0.005<br>0,127       | 0.025<br>0,635       | 0.010<br>0,254       | 12 |
| 08                      | 1/2  | 0.5000<br>12,7000      | 1.0000<br>25,4000      | 0.510<br>12,954      | 0.625<br>15,875      | 0.875<br>22,225 | 0.020<br>0,508       | 0.005<br>0,127       | 0.025<br>0,635       | 0.010<br>0,254       | 9  |
| 09                      | 9/16 | 0.5625<br>14,2875      | 1.1250<br>28,5750      | 0.541<br>13,741      | 0.687<br>17,450      | 1.000<br>25,400 | 0.020<br>0,508       | 0.005<br>0,127       | 0.025<br>0,635       | 0.010<br>0,254       | 11 |
| 10                      | 5/8  | 0.6250<br>15,8750      | 1.1875<br>30,1625      | 0.572<br>14,529      | 0.750<br>19,050      | 1.062<br>26,975 | 0.020<br>0,508       | 0.005<br>0,127       | 0.025<br>0,635       | 0.010<br>0,254       | 12 |

## Designation system

Examples: SW03GXCX2  
SW10Z

### Basic designation

### Bore code (multiples of 1/16 inch)

### Chamfer and groove

Z Chamfered outer ring  
G Grooved outer ring

### Starting torque

No code Standard  
X Reduced

### Surface treatment of outer ring

No code Not plated  
C<sup>1)</sup> Cadmium plated external dimensions  
J<sup>1)</sup> Zinc-nickel plated external dimensions

### Oversize

No code Standard outer diameter size  
Y1<sup>1)</sup> 0.005 in/0,127 mm oversized outer diameter  
Y2<sup>1)</sup> 0.010 in/0,254 mm oversized outer diameter  
Y3<sup>1)</sup> 0.015 in/0,381 mm oversized outer diameter  
Y4<sup>1)</sup> 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

## Loads and torque

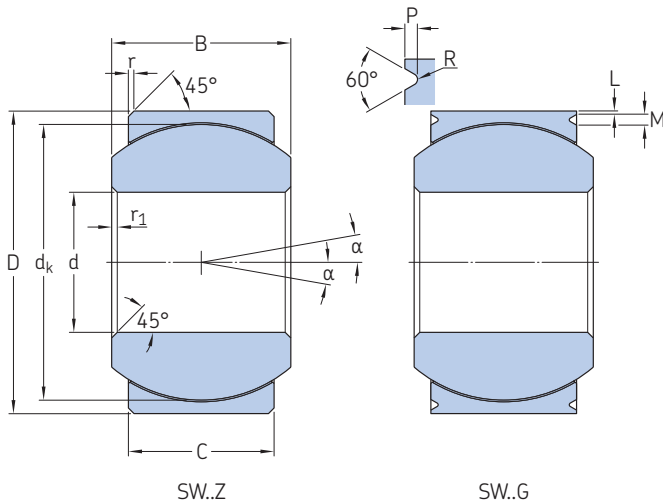
| Nominal bore code | Size | Mass<br>≈ | Static limit loads       |                                       | Radial limit load<br>C <sub>25</sub> | Starting torque<br>Standard | Reduced starting torque <sup>3)</sup><br>Max |
|-------------------|------|-----------|--------------------------|---------------------------------------|--------------------------------------|-----------------------------|----------------------------------------------|
|                   |      |           | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>2)</sup> |                                      |                             |                                              |
| –                 |      | lb/g      | lbf/kN                   |                                       |                                      | lbf-in/Nm                   |                                              |
| 03                | 3/16 | 0.03      | 9 000                    | 1 770                                 | 3 770                                | 1.0/5.0                     | 0.5                                          |
|                   |      | 13,6      | 40,03                    | 7,87                                  | 16,77                                | 0,11/0,56                   | 0,06                                         |
| 04                | 1/4  | 0.03      | 9 000                    | 1 770                                 | 3 770                                | 1.0/5.0                     | 1.0                                          |
|                   |      | 13,6      | 40,03                    | 7,87                                  | 16,77                                | 0,11/0,56                   | 0,11                                         |
| 05                | 5/16 | 0.03      | 9 400                    | 1 640                                 | 4 645                                | 1.0/5.0                     | 1.0                                          |
|                   |      | 13,6      | 41,81                    | 7,29                                  | 20,66                                | 0,11/0,56                   | 0,11                                         |
| 06                | 3/8  | 0.05      | 13 700                   | 2 628                                 | 6 389                                | 1.0/5.0                     | 1.0                                          |
|                   |      | 22,7      | 60,94                    | 11,69                                 | 28,42                                | 0,11/0,56                   | 0,11                                         |
| 07                | 7/16 | 0.08      | 20 700                   | 3 650                                 | 9 388                                | 1.0/5.0                     | 1.0                                          |
|                   |      | 36,3      | 92,07                    | 16,23                                 | 41,76                                | 0,11/0,56                   | 0,11                                         |
| 08                | 1/2  | 0.10      | 27 500                   | 4 989                                 | 12 149                               | 1.0/5.0                     | 1.0                                          |
|                   |      | 45,4      | 122,32                   | 22,19                                 | 54,04                                | 0,11/0,56                   | 0,11                                         |
| 09                | 9/16 | 0.14      | 34 400                   | 5 368                                 | 14 979                               | 1.0/5.0                     | 1.0                                          |
|                   |      | 63,5      | 153,01                   | 23,88                                 | 66,63                                | 0,11/0,56                   | 0,11                                         |
| 10                | 5/8  | 0.16      | 39 000                   | 6 128                                 | 16 688                               | 1.0/5.0                     | 1.0                                          |
|                   |      | 72,6      | 173,48                   | 27,26                                 | 74,23                                | 0,11/0,56                   | 0,11                                         |

<sup>2)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>3)</sup> The minimum starting torque is limited by zero radial and axial internal clearance

## 2.28 Self-lubricating wide (inch dimensions)

SW... bore code **12** to **32**



|                                |                                                                  |
|--------------------------------|------------------------------------------------------------------|
| <b>Technical specification</b> | AS 8942                                                          |
| <b>Product standards</b>       | NSA 8135 (chamfered outer ring)<br>NSA 8137 (grooved outer ring) |
| <b>Materials</b>               |                                                                  |
| Liner                          | X1                                                               |
| Inner ring                     | Corrosion-resistant steel 440C                                   |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                 |

| Nominal bore code | L<br>+0.010/0<br>+0.254/0 | M<br>+0.010/0<br>+0.254/0 |
|-------------------|---------------------------|---------------------------|
| -                 | in/mm                     |                           |
| ≤ 05              | 0.010/0.254               | 0.035/0.889               |
| 06 to 10          | 0.020/0.508               | 0.045/1.143               |
| ≥ 12              | 0.020/0.508               | 0.070/1.778               |

### Dimensions

| Nominal<br>bore<br>code | Size | Dimensions             |                        | C      | B      | d <sub>k</sub><br>≈ | r     | r <sub>1</sub> | P     | R     | α  |
|-------------------------|------|------------------------|------------------------|--------|--------|---------------------|-------|----------------|-------|-------|----|
|                         |      | d                      | D                      |        |        |                     |       |                |       |       |    |
|                         |      | 0/−0.0005<br>0/−0,0127 | 0/−0.0005<br>0/−0,0127 |        |        |                     |       |                |       |       |    |
| in/mm                   |      |                        |                        |        |        |                     |       |                |       |       |    |
| 12                      | ¾    | 0.7500                 | 1.3750                 | 0.635  | 0.875  | 1.250               | 0.020 | 0.005          | 0.045 | 0.010 | 14 |
|                         |      | 19,0500                | 34,9250                | 16,129 | 22,225 | 31,750              | 0,508 | 0,127          | 1,143 | 0,254 |    |
| 14                      | 7/8  | 0.8750                 | 1.6250                 | 0.760  | 0.875  | 1.375               | 0.020 | 0.005          | 0.045 | 0.010 | 7  |
|                         |      | 22,2250                | 41,2750                | 19,304 | 22,225 | 34,925              | 0,508 | 0,127          | 1,143 | 0,254 |    |
| 16                      | 1    | 1.0000                 | 2.1250                 | 1.010  | 1.375  | 1.937               | 0.020 | 0.005          | 0.045 | 0.010 | 15 |
|                         |      | 25,4000                | 53,9750                | 25,654 | 34,925 | 49,200              | 0,508 | 0,127          | 1,143 | 0,254 |    |
| 20                      | 1¼   | 1.2500                 | 2.3750                 | 1.135  | 1.500  | 2.156               | 0.030 | 0.005          | 0.045 | 0.010 | 12 |
|                         |      | 31,7500                | 60,3250                | 28,829 | 38,100 | 54,762              | 0,763 | 0,127          | 1,143 | 0,254 |    |
| 24                      | 1½   | 1.5000                 | 2.6875                 | 1.228  | 1.687  | 2.437               | 0.040 | 0.005          | 0.045 | 0.010 | 12 |
|                         |      | 38,1000                | 68,2625                | 31,191 | 42,850 | 61,900              | 1,016 | 0,127          | 1,143 | 0,254 |    |
| 28                      | 1¾   | 1.7500                 | 3.0000                 | 1.322  | 1.812  | 2.750               | 0.040 | 0.005          | 0.045 | 0.010 | 12 |
|                         |      | 44,4500                | 76,2000                | 33,579 | 46,025 | 69,850              | 1,016 | 0,127          | 1,143 | 0,254 |    |
| 32                      | 2    | 2.0000                 | 3.2500                 | 1.385  | 1.937  | 3.000               | 0.040 | 0.005          | 0.045 | 0.010 | 12 |
|                         |      | 50,8000                | 82,5500                | 35,179 | 49,200 | 76,200              | 1,016 | 0,127          | 1,143 | 0,254 |    |

## Designation system

Examples: SW03GXCX2  
SW10Z

SW 03 G X C Y2

### Basic designation

### Bore code (multiples of 1/16 inch)

### Chamfer and groove

Z Chamfered outer ring  
G Grooved outer ring

### Starting torque

No code Standard  
X Reduced

### Surface treatment of outer ring

No code Not plated  
C<sup>1)</sup> Cadmium plated external dimensions  
J<sup>1)</sup> Zinc-nickel plated external dimensions

### Oversize

No code Standard outer diameter size  
Y1<sup>1)</sup> 0.005 in/0,127 mm oversized outer diameter  
Y2<sup>1)</sup> 0.010 in/0,254 mm oversized outer diameter  
Y3<sup>1)</sup> 0.015 in/0,381 mm oversized outer diameter  
Y4<sup>1)</sup> 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> SKF option

## Loads and torque

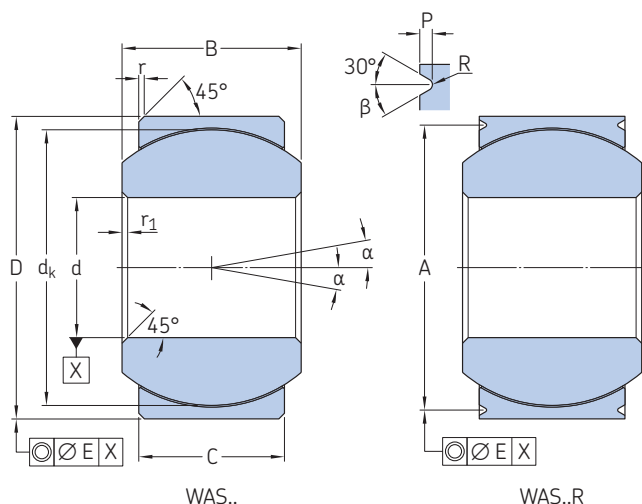
| Nominal bore code | Size  | Mass ≈          | Static limit loads    |                                    | Radial limit load C25 | Starting torque       |                                           |
|-------------------|-------|-----------------|-----------------------|------------------------------------|-----------------------|-----------------------|-------------------------------------------|
|                   |       |                 | Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>2)</sup> |                       | Standard              | Reduced starting torque <sup>3)</sup> Max |
| –                 |       | lb/g            | lbf/kN                |                                    |                       | lbf-in/Nm             |                                           |
| 12                | 3/4   | 0.23<br>104,3   | 52 300<br>232,64      | 7 730<br>34,38                     | 22 101<br>98,31       | 1.0/5.0<br>0,11/0,56  | 1.0<br>0,11                               |
| 14                | 7/8   | 0.35<br>158,8   | 67 300<br>299,36      | 10 800<br>48,04                    | 28 198<br>125,43      | 2.0/8.0<br>0,23/0,90  | 2.0<br>0,23                               |
| 16                | 1     | 0.97<br>440,0   | 137 000<br>609,40     | 19 300<br>85,85                    | 53 698<br>238,86      | 2.0/8.0<br>0,23/0,90  | 2.0<br>0,23                               |
| 20                | 1 1/4 | 1.10<br>500,0   | 127 781<br>568,40     | 26 058<br>115,91                   | 66 447<br>295,57      | 2.0/16.0<br>0,23/1,81 | 2.2<br>0,25                               |
| 24                | 1 1/2 | 1.54<br>700,0   | 158 715<br>706,00     | 30 963<br>137,73                   | 82 532<br>367,12      | 2.0/16.0<br>0,23/1,81 | 2.2<br>0,25                               |
| 28                | 1 3/4 | 1.98<br>900,0   | 193 210<br>859,44     | 36 363<br>161,75                   | 100 175<br>445,60     | 2.0/16.0<br>0,23/1,81 | 2.2<br>0,25                               |
| 32                | 2     | 2.31<br>1 050,0 | 223 946<br>996,16     | 40 466<br>180,00                   | 116 451<br>518,00     | 2.0/16.0<br>0,23/1,81 | 2.2<br>0,25                               |

<sup>2)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>3)</sup> The minimum starting torque is limited by zero radial and axial internal clearance

## 2.29 Self-lubricating wide (inch dimensions)

WAS.. (XRL..., 11HW.. or 11BW..) <sup>1)</sup> bore code **3** to **9**



|                                |                                                                  |
|--------------------------------|------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81820                                                         |
| <b>Product standards</b>       | AS 14102 (chamfered outer ring)<br>AS 14103 (grooved outer ring) |
| <b>Materials</b>               |                                                                  |
| Liner                          | X1                                                               |
| Inner ring                     | Passivated corrosion-resistant steel<br>440C or PH13.8           |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                 |

| Nominal bore code | β  | E           |
|-------------------|----|-------------|
| -                 | °  | in/mm       |
| ≤ 5               | 20 | 0.005/0,127 |
| ≥ 6               | 30 | 0.005/0,127 |

### Dimensions

| Nominal<br>bore<br>code | Size | Dimensions             |                        |                  |                      |                |                  |                      |                      |                      |             | α <sup>4)</sup> |
|-------------------------|------|------------------------|------------------------|------------------|----------------------|----------------|------------------|----------------------|----------------------|----------------------|-------------|-----------------|
|                         |      | d                      | D                      | C                | B                    | d <sub>k</sub> | r <sub>1</sub>   | r                    | A                    | P                    | R           |                 |
|                         |      | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | ±0.005<br>±0,127 | 0/-0.002<br>0/-0,051 | ≈              | ±0.005<br>±0,127 | +0.010/0<br>+0,254/0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |             |                 |
| —                       |      | in/mm                  |                        |                  |                      |                |                  |                      |                      |                      |             | °               |
| 3                       | 3/16 | 0.1900                 | 0.6250                 | 0.327            | 0.437                | 0.530          | 0.010            | 0.010                | 0.563                | 0.025                | 0.005/0.010 | 15              |
|                         |      | 4,826                  | 15,875                 | 8,306            | 11,100               | 13,464         | 0,254            | 0,254                | 14,300               | 0,635                | 0,127/0,254 |                 |
| 4                       | 1/4  | 0.2500                 | 0.6250                 | 0.327            | 0.437                | 0.530          | 0.010            | 0.010                | 0.563                | 0.025                | 0.005/0.010 | 15              |
|                         |      | 6,350                  | 15,875                 | 8,306            | 11,100               | 13,464         | 0,254            | 0,254                | 14,300               | 0,635                | 0,127/0,254 |                 |
| 5                       | 5/16 | 0.3125                 | 0.6875                 | 0.317            | 0.437                | 0.566          | 0.010            | 0.010                | 0.625                | 0.025                | 0.005/0.010 | 14              |
|                         |      | 7,938                  | 17,462                 | 8,052            | 11,100               | 14,381         | 0,254            | 0,254                | 15,875               | 0,635                | 0,127/0,254 |                 |
| 6                       | 3/8  | 0.3750                 | 0.8125                 | 0.406            | 0.500                | 0.683          | 0.010            | 0.020                | 0.712                | 0.035                | 0.010/0.017 | 8               |
|                         |      | 9,525                  | 20,638                 | 10,312           | 12,700               | 17,361         | 0,254            | 0,508                | 18,085               | 0,889                | 0,254/0,432 |                 |
| 7                       | 7/16 | 0.4375                 | 0.9375                 | 0.442            | 0.562                | 0.777          | 0.010            | 0.020                | 0.837                | 0.035                | 0.010/0.017 | 10              |
|                         |      | 11,113                 | 23,812                 | 11,227           | 14,275               | 19,744         | 0,254            | 0,508                | 21,260               | 0,889                | 0,254/0,432 |                 |
| 7A                      | 7/16 | 0.4375                 | 0.9062                 | 0.442            | 0.562                | 0.777          | 0.010            | 0.020                | 0.806                | 0.035                | 0.010/0.017 | 10              |
|                         |      | 11,113                 | 23,017                 | 11,227           | 14,275               | 19,744         | 0,254            | 0,508                | 20,472               | 0,889                | 0,254/0,432 |                 |
| 8                       | 1/2  | 0.5000                 | 1.0000                 | 0.505            | 0.625                | 0.871          | 0.010            | 0.020                | 0.900                | 0.035                | 0.010/0.017 | 9               |
|                         |      | 12,700                 | 25,400                 | 12,827           | 15,875               | 22,130         | 0,254            | 0,508                | 22,860               | 0,889                | 0,254/0,432 |                 |
| 9                       | 9/16 | 0.5625                 | 1.1250                 | 0.536            | 0.687                | 0.996          | 0.010            | 0.020                | 1.025                | 0.035                | 0.010/0.017 | 10              |
|                         |      | 14,288                 | 28,575                 | 13,614           | 17,450               | 25,296         | 0,254            | 0,508                | 26,035               | 0,889                | 0,254/0,432 |                 |

### Loads and torque

| Nominal bore code | Size        | Mass ≈      | Static limit loads | Radial dynamic load | Starting torque <sup>4)</sup> | Standard            | Standard, SKF precision | Reduced <sup>3)</sup> max |
|-------------------|-------------|-------------|--------------------|---------------------|-------------------------------|---------------------|-------------------------|---------------------------|
|                   |             | lb/g        | lbf/kN             | C <sub>25</sub>     | lbf-in/Nm                     |                     |                         |                           |
| <b>3</b>          | <b>3/16</b> | 0.03<br>14  | 2 500<br>11,12     | 1 770<br>7,88       | 4 900<br>21,80                | 0.25/5<br>0,03/0,56 | 0.5/5<br>0,06/0,56      | 0.5<br>0,06               |
| <b>4</b>          | <b>1/4</b>  | 0.03<br>14  | 5 500<br>24,47     | 1 770<br>7,88       | 4 900<br>21,80                | 0.25/5<br>0,03/0,56 | 1/5<br>0,11/0,56        | 0.5<br>0,06               |
| <b>5</b>          | <b>5/16</b> | 0.035<br>16 | 9 400<br>41,83     | 1 640<br>7,30       | 6 050<br>26,88                | 0.25/8<br>0,03/0,90 | 1/5<br>0,11/0,56        | 1<br>0,11                 |
| <b>6</b>          | <b>3/8</b>  | 0.06<br>27  | 13 700<br>60,96    | 2 630<br>11,70      | 8 310<br>36,98                | 0.25/8<br>0,03/0,90 | 1/5<br>0,11/0,56        | 1<br>0,11                 |
| <b>7</b>          | <b>7/16</b> | 0.08<br>38  | 20 700<br>92,11    | 3 650<br>16,24      | 11 750<br>52,29               | 0.25/8<br>0,03/0,90 | 1/5<br>0,11/0,56        | 1<br>0,11                 |
| <b>7A</b>         | <b>7/16</b> | 0.08<br>38  | 19 700<br>87,63    | 3 650<br>16,24      | 11 750<br>52,29               | 0.25/8<br>0,03/0,90 | 1/5<br>0,11/0,56        | 1<br>0,11                 |
| <b>8</b>          | <b>1/2</b>  | 0.10<br>45  | 21 400<br>95,23    | 4 970<br>22,12      | 14 950<br>66,53               | 0.25/8<br>0,03/0,90 | 1/5<br>0,11/0,56        | 1<br>0,11                 |
| <b>9</b>          | <b>9/16</b> | 0.135<br>61 | 26 600<br>118,37   | 5 370<br>23,90      | 18 100<br>80,54               | 0.25/8<br>0,03/0,90 | 1/5<br>0,11/0,56        | 1<br>0,11                 |

<sup>1)</sup> Parts are delivered and marked with SKF standard XRL..., 11HW.. (inner ring spherical surface coated) or 11BW.. references.

<sup>2)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149

# Cross-reference designation system to XRL..., 11HW.. or 11BW..

|                                                          |                                                                         |   |   |     |    |   |   |    |   |   |
|----------------------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|---|----|---|---|
| Examples:                                                | ZWAS12RXTTFY2                                                           | Z | E | WAS | 12 | R | X | TT | F | R |
|                                                          | WAS 3PPD                                                                |   |   |     |    |   |   |    |   |   |
| <b>Surface treatment of outer ring</b>                   |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | Not plated                                                              |   |   |     |    |   |   |    |   |   |
| <b>Z</b>                                                 | Cadmium plated external dimensions                                      |   |   |     |    |   |   |    |   |   |
| <b>SZ</b>                                                | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |   |    |   |   |
| <b>Inner ring material</b>                               |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | 440C                                                                    |   |   |     |    |   |   |    |   |   |
| <b>E</b>                                                 | PH13.8                                                                  |   |   |     |    |   |   |    |   |   |
| <b>Basic designation</b>                                 |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch)                |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>Chamfer and groove</b>                                |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code<sup>3)</sup></b>                              | Chamfered outer ring                                                    |   |   |     |    |   |   |    |   |   |
| <b>R</b>                                                 | Grooved outer ring                                                      |   |   |     |    |   |   |    |   |   |
| <b>Starting torque</b>                                   |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | Standard                                                                |   |   |     |    |   |   |    |   |   |
| <b>XS<sup>1)</sup></b>                                   | Standard, SKF precision                                                 |   |   |     |    |   |   |    |   |   |
| <b>X</b>                                                 | Reduced                                                                 |   |   |     |    |   |   |    |   |   |
| <b>Shield and seal</b>                                   |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | No shield and seal                                                      |   |   |     |    |   |   |    |   |   |
| <b>TT<sup>2)</sup></b>                                   | Sealed                                                                  |   |   |     |    |   |   |    |   |   |
| <b>PP<sup>2)</sup></b>                                   | Shielded                                                                |   |   |     |    |   |   |    |   |   |
| <b>Material and surface treatment of inner ring code</b> |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | Passivated inner ring                                                   |   |   |     |    |   |   |    |   |   |
| <b>F<sup>1)</sup></b>                                    | Chromium plated sphere                                                  |   |   |     |    |   |   |    |   |   |
| <b>D<sup>1)</sup></b>                                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |   |    |   |   |
| <b>K<sup>1)</sup> 4)</b>                                 | XLHP coated sphere                                                      |   |   |     |    |   |   |    |   |   |
| <b>N<sup>1)</sup> 4)</b>                                 | XLNT coated sphere                                                      |   |   |     |    |   |   |    |   |   |
| <b>H<sup>1)</sup> 4)</b>                                 | XL coated sphere                                                        |   |   |     |    |   |   |    |   |   |
| <b>Oversize</b>                                          |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | Standard outer diameter size                                            |   |   |     |    |   |   |    |   |   |
| <b>Y2</b>                                                | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |    |   |   |    |   |   |
| <b>Y4</b>                                                | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |    |   |   |    |   |   |

1) SKF option

2) SKF option, only available for  $d \geq 5$

3) SKF option for code 7A

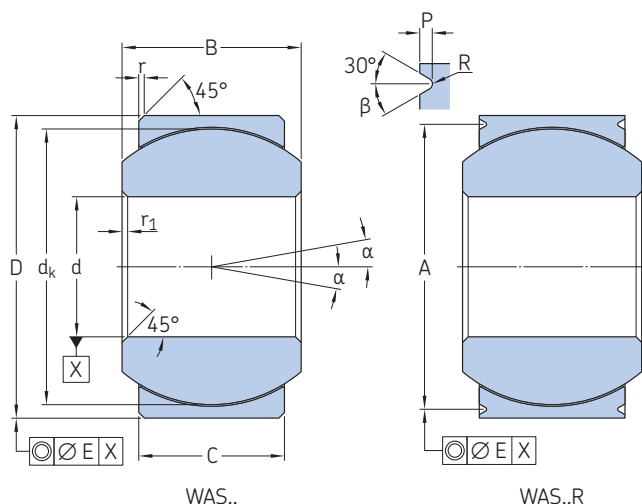
4) For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

3) If starting torque is  $\leq 0.1$  lbf-in (0,01 Nm), maximum internal clearance must be:

| Nominal bore code | Maximum radial clearance | Maximum axial clearance |
|-------------------|--------------------------|-------------------------|
| -                 | in/mm                    |                         |
| $\leq 12$         | 0.0007/0,0178            | 0.0021/0,0533           |
| $\geq 14$         | 0.0010/0,0254            | 0.0040/0,1016           |

## 2.29 Self-lubricating wide (inch dimensions)

WAS.. (XRL.., 11HW.. or 11BW..) <sup>2)</sup> bore code **10** to **32**



|                                |                                                                  |
|--------------------------------|------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81820                                                         |
| <b>Product standards</b>       | AS 14102 (chamfered outer ring)<br>AS 14103 (grooved outer ring) |
| <b>Materials</b>               |                                                                  |
| Liner                          | X1                                                               |
| Inner ring                     | Passivated corrosion-resistant steel<br>440C or PH13.8           |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                 |

| Nominal bore code | $\beta$ | E           |
|-------------------|---------|-------------|
| -                 | °       | in/mm       |
| ≤ 5               | 20      | 0.005/0,127 |
| ≥ 6               | 30      | 0.005/0,127 |

### Dimensions

| Nominal<br>bore<br>code | Size  | Dimensions             |                        |                  |                      |                |                  |                      |                      |                      |             | α <sup>4)</sup> |
|-------------------------|-------|------------------------|------------------------|------------------|----------------------|----------------|------------------|----------------------|----------------------|----------------------|-------------|-----------------|
|                         |       | d                      | D                      | C                | B                    | d <sub>k</sub> | r <sub>1</sub>   | r                    | A                    | P                    | R           |                 |
|                         |       | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | ±0.005<br>±0,127 | 0/-0.002<br>0/-0,051 | ≈              | ±0.005<br>±0,127 | +0.010/0<br>+0,254/0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |             |                 |
| —                       |       | in/mm                  |                        |                  |                      |                |                  |                      |                      |                      |             | °               |
| 10                      | 5/8   | 0.6250                 | 1.1875                 | 0.567            | 0.750                | 1.059          | 0.010            | 0.020                | 1.087                | 0.035                | 0.010/0.017 | 12              |
|                         |       | 15,875                 | 30,163                 | 14,400           | 19,050               | 26,887         | 0,254            | 0,508                | 27,610               | 0,889                | 0,254/0,432 |                 |
| 12                      | 3/4   | 0.7500                 | 1.3750                 | 0.630            | 0.875                | 1.216          | 0.010            | 0.030                | 1.251                | 0.055                | 0.010/0.017 | 13              |
|                         |       | 19,050                 | 34,925                 | 16,002           | 22,225               | 30,897         | 0,254            | 0,762                | 31,775               | 1,397                | 0,254/0,432 |                 |
| 14                      | 7/8   | 0.8750                 | 1.6250                 | 0.755            | 0.875                | 1.325          | 0.010            | 0.030                | 1.501                | 0.055                | 0.010/0.017 | 6               |
|                         |       | 22,225                 | 41,275                 | 19,177           | 22,225               | 33,655         | 0,254            | 0,762                | 38,125               | 1,397                | 0,254/0,432 |                 |
| 16                      | 1     | 1.0000                 | 2.1250                 | 1.005            | 1.375                | 1.871          | 0.010            | 0.030                | 2.001                | 0.055                | 0.010/0.017 | 12              |
|                         |       | 25,400                 | 53,975                 | 25,527           | 34,925               | 47,526         | 0,254            | 0,762                | 50,825               | 1,397                | 0,254/0,432 |                 |
| 20 <sup>1)</sup>        | 1 1/4 | 1.2500                 | 2.3750                 | 1.130            | 1.500                | 2.095          | 0.010            | 0.030                | 2.253                | 0.060                | 0.010/0.020 | 12              |
|                         |       | 31,750                 | 60,325                 | 28,702           | 38,100               | 53,203         | 0,254            | 0,762                | 57,230               | 1,524                | 0,254/0,508 |                 |
| 24 <sup>1)</sup>        | 1 1/2 | 1.5000                 | 2.6875                 | 1.223            | 1.687                | 2.393          | 0.010            | 0.030                | 2.565                | 0.060                | 0.010/0.020 | 12              |
|                         |       | 38,100                 | 68,260                 | 31,064           | 42,850               | 60,779         | 0,254            | 0,762                | 65,160               | 1,524                | 0,254/0,508 |                 |
| 28 <sup>1)</sup>        | 1 3/4 | 1.7500                 | 3.0000                 | 1.317            | 1.812                | 2.673          | 0.010            | 0.030                | 2.878                | 0.060                | 0.010/0.020 | 12              |
|                         |       | 44,450                 | 76,200                 | 33,452           | 46,020               | 67,892         | 0,254            | 0,762                | 73,100               | 1,524                | 0,254/0,508 |                 |
| 32 <sup>1)</sup>        | 2     | 2.0000                 | 3.2500                 | 1.380            | 1.937                | 2.938          | 0.010            | 0.030                | 3.128                | 0.060                | 0.010/0.020 | 12              |
|                         |       | 50,800                 | 82,550                 | 35,050           | 49,190               | 74,624         | 0,254            | 0,762                | 79,451               | 1,524                | 0,254/0,508 |                 |

### Loads and torque

| Nominal bore code      | Size         | Mass ≈        | Static limit loads | Radial C <sub>s</sub> | Axial C <sub>a</sub> <sup>3)</sup> | Radial dynamic load C <sub>25</sub> | Starting torque <sup>4)</sup> | Standard | Standard, SKF precision | Reduced <sup>4)</sup> max |
|------------------------|--------------|---------------|--------------------|-----------------------|------------------------------------|-------------------------------------|-------------------------------|----------|-------------------------|---------------------------|
| -                      |              | lb/g          | lbf/kN             |                       |                                    |                                     | lbf-in/Nm                     |          |                         |                           |
| <b>10</b>              | <b>5/8</b>   | 0.16<br>73    | 29 000<br>129,00   | 6 130<br>27,28        | 20 250<br>90,11                    | 0.25/8<br>0,03/0,90                 | 1/5<br>0,11/0,56              | 1        |                         | 0,11                      |
| <b>12</b>              | <b>3/4</b>   | 0.24<br>109   | 37 000<br>164,65   | 7 730<br>34,40        | 26 200<br>116,59                   | 0.25/8<br>0,03/0,90                 | 1/5<br>0,11/0,56              | 1        |                         | 0,11                      |
| <b>14</b>              | <b>7/8</b>   | 0.35<br>159   | 65 200<br>290,14   | 10 800<br>48,06       | 33 600<br>149,52                   | 0.25/12<br>0,03/1,36                | 2/8<br>0,23/0,9               | 2        |                         | 0,23                      |
| <b>16</b>              | <b>1</b>     | 0.97<br>440   | 104 000<br>462,80  | 19 300<br>85,88       | 56 250<br>250,31                   | 0.25/12<br>0,03/1,36                | 2/8<br>0,23/0,9               | 2        |                         | 0,23                      |
| <b>20<sup>1)</sup></b> | <b>1 1/4</b> | 1.10<br>500   | 127 890<br>568,40  | 26 080<br>115,91      | 66 450<br>295,57                   | 2/20<br>0,23/2,26                   | 2.4/15.5<br>0,28/1,75         | 2.4      |                         | 0,28                      |
| <b>24<sup>1)</sup></b> | <b>1 1/2</b> | 1.54<br>700   | 158 850<br>706,00  | 30 989<br>137,73      | 82 536<br>367,12                   | 2/20<br>0,23/2,26                   | 2.4/15.5<br>0,28/1,75         | 2.4      |                         | 0,28                      |
| <b>28<sup>1)</sup></b> | <b>1 3/4</b> | 1.99<br>900   | 193 374<br>859,44  | 36 934<br>161,75      | 72 410<br>445,60                   | 10/35<br>1,3/3,9                    | 4.5/19<br>0,5/2,15            | 4.5      |                         | 0,5                       |
| <b>32<sup>1)</sup></b> | <b>2</b>     | 2.31<br>1 050 | 224 136<br>996,16  | 40 449<br>180,00      | 116 457<br>518,00                  | 10/35<br>1,3/3,9                    | 4.5/19<br>0,5/2,15            | 4.5      |                         | 0,5                       |

<sup>1)</sup> SKF option <sup>2)</sup> Parts are delivered and marked with SKF standard XRL.., 11HW.. (inner ring spherical surface coated) or 11BW.. references.

<sup>3)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



# Cross-reference designation system to XRL..., 11HW.. or 11BW..

|                                                          |                                                                         |   |   |     |    |   |   |    |   |   |
|----------------------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|---|----|---|---|
| Examples:                                                | ZWAS12RXTTFY2                                                           | Z | E | WAS | 12 | R | X | TT | F | R |
|                                                          | WAS 3PPD                                                                |   |   |     |    |   |   |    |   |   |
| <b>Surface treatment of outer ring</b>                   |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | Not plated                                                              |   |   |     |    |   |   |    |   |   |
| <b>Z</b>                                                 | Cadmium plated external dimensions                                      |   |   |     |    |   |   |    |   |   |
| <b>SZ</b>                                                | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |   |    |   |   |
| <b>Inner ring material</b>                               |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | 440C                                                                    |   |   |     |    |   |   |    |   |   |
| <b>E</b>                                                 | PH13.8                                                                  |   |   |     |    |   |   |    |   |   |
| <b>Basic designation</b>                                 |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch)                |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>Chamfer and groove</b>                                |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code<sup>3)</sup></b>                              | Chamfered outer ring                                                    |   |   |     |    |   |   |    |   |   |
| <b>R</b>                                                 | Grooved outer ring                                                      |   |   |     |    |   |   |    |   |   |
| <b>Starting torque</b>                                   |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | Standard                                                                |   |   |     |    |   |   |    |   |   |
| <b>XS<sup>1)</sup></b>                                   | Standard, SKF precision                                                 |   |   |     |    |   |   |    |   |   |
| <b>X</b>                                                 | Reduced                                                                 |   |   |     |    |   |   |    |   |   |
| <b>Shield and seal</b>                                   |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | No shield and seal                                                      |   |   |     |    |   |   |    |   |   |
| <b>TT<sup>2)</sup></b>                                   | Sealed                                                                  |   |   |     |    |   |   |    |   |   |
| <b>PP<sup>2)</sup></b>                                   | Shielded                                                                |   |   |     |    |   |   |    |   |   |
| <b>Material and surface treatment of inner ring code</b> |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | Passivated inner ring                                                   |   |   |     |    |   |   |    |   |   |
| <b>F<sup>1)</sup></b>                                    | Chromium plated sphere                                                  |   |   |     |    |   |   |    |   |   |
| <b>D<sup>1)</sup></b>                                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |   |    |   |   |
| <b>K<sup>1)</sup> 4)</b>                                 | XLHP coated sphere                                                      |   |   |     |    |   |   |    |   |   |
| <b>N<sup>1)</sup> 4)</b>                                 | XLNT coated sphere                                                      |   |   |     |    |   |   |    |   |   |
| <b>H<sup>1)</sup> 4)</b>                                 | XL coated sphere                                                        |   |   |     |    |   |   |    |   |   |
| <b>Oversize</b>                                          |                                                                         |   |   |     |    |   |   |    |   |   |
| <b>No code</b>                                           | Standard outer diameter size                                            |   |   |     |    |   |   |    |   |   |
| <b>Y2</b>                                                | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |    |   |   |    |   |   |
| <b>Y4</b>                                                | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |    |   |   |    |   |   |

1) SKF option

2) SKF option, only available for d ≥ 5

3) SKF option for code 7A

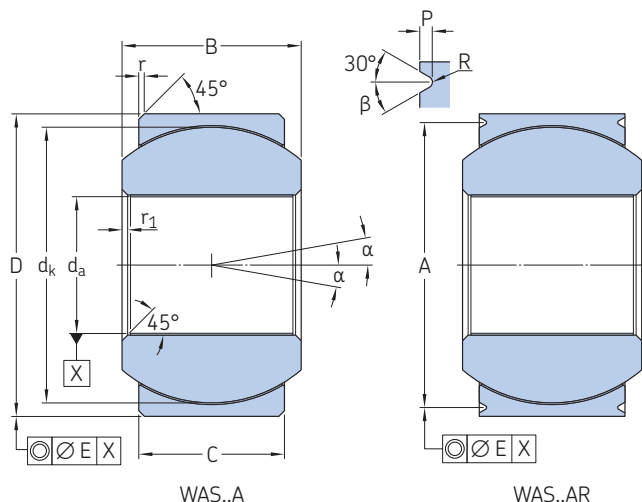
4) For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

4) If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

| Nominal bore code | Maximum radial clearance | Maximum axial clearance |
|-------------------|--------------------------|-------------------------|
| -                 | in/mm                    |                         |
| ≤ 12              | 0.0007/0,0178            | 0.0021/0,0533           |
| ≥ 14              | 0.0010/0,0254            | 0.0040/0,1016           |

## 2.30 Self-lubricating wide (inch dimensions)

WAS..A (XRL..A., 11LHW.. or 11LBW..) <sup>2)</sup> bore code **3 to 9**



|                                |                                                                                            |
|--------------------------------|--------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81820                                                                                   |
| <b>Product standards</b>       | AS 81820/2 (lined bore chamfered outer ring)<br>AS 81820/3 (lined bore grooved outer ring) |
| <b>Materials</b>               |                                                                                            |
| Liner                          | X1                                                                                         |
| Inner ring                     | Passivated corrosion-resistant steel<br>440C or PH13.8                                     |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                                           |

| $\beta$ | E           |
|---------|-------------|
| °       | in/mm       |
| 30      | 0.006/0,152 |

### Dimensions

| Nominal<br>bore<br>code | Size | Dimensions             |                        |                            |                      |           |       |                      |                      |                      |             | $\alpha^{(4)}$ |
|-------------------------|------|------------------------|------------------------|----------------------------|----------------------|-----------|-------|----------------------|----------------------|----------------------|-------------|----------------|
|                         |      | $d_a$                  | D                      | C                          | B                    | $d_k$     | $r_1$ | r                    | A                    | P                    | R           |                |
|                         |      | 0/-0.0010<br>0/-0,0254 | 0/-0.0005<br>0/-0,0127 | $\pm 0.005$<br>$\pm 0,127$ | 0/-0.002<br>0/-0,051 | $\approx$ | max   | +0.010/0<br>+0,254/0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |             |                |
| —                       |      | in/mm                  |                        |                            |                      |           |       |                      |                      |                      |             | °              |
| 3 <sup>1)</sup>         | 3/16 | 0.1910                 | 0.6250                 | 0.327                      | 0.437                | 0.530     | 0.005 | 0.015                | 0.563                | 0.025                | 0.005/0.012 | 15             |
|                         |      | 4,851                  | 15,875                 | 8,306                      | 11,100               | 13,464    | 0,127 | 0,381                | 14,300               | 0,635                | 0,127/0,305 |                |
| 4 <sup>1)</sup>         | 1/4  | 0.2510                 | 0.6250                 | 0.327                      | 0.437                | 0.530     | 0.005 | 0.015                | 0.563                | 0.025                | 0.005/0.012 | 15             |
|                         |      | 6,375                  | 15,875                 | 8,306                      | 11,100               | 13,464    | 0,127 | 0,381                | 14,300               | 0,635                | 0,127/0,305 |                |
| 5                       | 5/16 | 0.3135                 | 0.6875                 | 0.317                      | 0.437                | 0.566     | 0.005 | 0.015                | 0.625                | 0.025                | 0.005/0.012 | 14             |
|                         |      | 7,963                  | 17,462                 | 8,052                      | 11,100               | 14,381    | 0,127 | 0,381                | 15,875               | 0,635                | 0,127/0,305 |                |
| 6                       | 3/8  | 0.3760                 | 0.8125                 | 0.406                      | 0.500                | 0.683     | 0.005 | 0.020                | 0.712                | 0.035                | 0.010/0.017 | 8              |
|                         |      | 9,550                  | 20,638                 | 10,312                     | 12,700               | 17,361    | 0,127 | 0,508                | 18,085               | 0,889                | 0,254/0,432 |                |
| 7                       | 7/16 | 0.4385                 | 0.9375                 | 0.442                      | 0.562                | 0.777     | 0.005 | 0.020                | 0.837                | 0.035                | 0.010/0.017 | 10             |
|                         |      | 11,138                 | 23,812                 | 11,227                     | 14,275               | 19,744    | 0,127 | 0,508                | 21,260               | 0,889                | 0,254/0,432 |                |
| 7A                      | 7/16 | 0.4385                 | 0.9062                 | 0.442                      | 0.562                | 0.777     | 0.005 | 0.020                | 0.806                | 0.035                | 0.010/0.017 | 10             |
|                         |      | 11,138                 | 23,017                 | 11,227                     | 14,275               | 19,744    | 0,127 | 0,508                | 20,472               | 0,889                | 0,254/0,432 |                |
| 8                       | 1/2  | 0.5010                 | 1.0000                 | 0.505                      | 0.625                | 0.871     | 0.005 | 0.020                | 0.900                | 0.035                | 0.010/0.017 | 9              |
|                         |      | 12,725                 | 25,400                 | 12,827                     | 15,875               | 22,130    | 0,127 | 0,508                | 22,860               | 0,889                | 0,254/0,432 |                |
| 9                       | 9/16 | 0.5635                 | 1.1250                 | 0.536                      | 0.687                | 0.996     | 0.005 | 0.020                | 1.025                | 0.035                | 0.010/0.017 | 10             |
|                         |      | 14,313                 | 28,575                 | 13,614                     | 17,450               | 25,296    | 0,127 | 0,508                | 26,035               | 0,889                | 0,254/0,432 |                |

### Loads and torque

| Nominal bore code | Size | Mass $\approx$ | Static limit loads | Radial dynamic load  | Starting torque <sup>4)</sup> |                     |                           |
|-------------------|------|----------------|--------------------|----------------------|-------------------------------|---------------------|---------------------------|
|                   |      |                | Radial<br>$C_s$    | Axial<br>$C_a^{(3)}$ | C25                           | Standard            | Standard, SKF precision   |
|                   |      | lb/g           | lbf/kN             |                      |                               | lbf-in/Nm           | Reduced <sup>4)</sup> max |
| 3 <sup>1)</sup>   | 3/16 | 0.03<br>14     | 2 500<br>11,12     | 1 770<br>7,88        | 4 900<br>21,80                | 0.25/5<br>0,03/0,56 | 0.5/5<br>0,06/0,56        |
| 4 <sup>1)</sup>   | 1/4  | 0.03<br>14     | 5 500<br>24,47     | 1 770<br>7,88        | 4 900<br>21,80                | 0.25/5<br>0,03/0,56 | 1/5<br>0,11/0,56          |
| 5                 | 5/16 | 0.035<br>16    | 9 400<br>41,83     | 1 640<br>7,30        | 6 050<br>26,88                | 1/15<br>0,11/1,69   | 1/5<br>0,11/0,56          |
| 6                 | 3/8  | 0.06<br>27     | 13 700<br>60,96    | 2 630<br>11,70       | 8 310<br>36,98                | 1/15<br>0,11/1,69   | 1/5<br>0,11/0,56          |
| 7                 | 7/16 | 0.08<br>38     | 20 700<br>92,11    | 3 650<br>16,24       | 11 750<br>52,29               | 1/15<br>0,11/1,69   | 1/5<br>0,11/0,56          |
| 7A                | 7/16 | 0.08<br>38     | 19 700<br>87,63    | 3 650<br>16,24       | 11 750<br>52,29               | 1/15<br>0,11/1,69   | 1/5<br>0,11/0,56          |
| 8                 | 1/2  | 0.10<br>45     | 21 400<br>95,23    | 4 970<br>22,12       | 14 950<br>66,53               | 1/15<br>0,11/1,69   | 1/5<br>0,11/0,56          |
| 9                 | 9/16 | 0.135<br>61    | 26 600<br>118,37   | 5 370<br>23,90       | 18 100<br>80,54               | 1/15<br>0,11/1,69   | 1/5<br>0,11/0,56          |

<sup>1)</sup> SKF option <sup>2)</sup> Parts are delivered and marked with SKF standard XRL..A., 11LHW (inner ring spherical surface coated) or 11LBW.. references.

<sup>3)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149

**Cross-reference designation system to XRE..A, 11LHN.. or 11LBN..**

|                                                                |                                                                         |   |   |     |    |   |   |   |    |   |    |
|----------------------------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|---|---|----|---|----|
| Examples:                                                      | ZWAS12ARXTTFY2                                                          | Z | E | WAS | 12 | A | R | X | TT | F | Y2 |
|                                                                | WAS 3APPD                                                               |   |   |     |    |   |   |   |    |   |    |
| <b>Surface treatment of outer ring</b> _____                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                                 | Not plated                                                              |   |   |     |    |   |   |   |    |   |    |
| <b>Z</b>                                                       | Cadmium plated external dimensions                                      |   |   |     |    |   |   |   |    |   |    |
| <b>SZ</b>                                                      | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |   |   |    |   |    |
| <b>Inner ring material</b> _____                               |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                                 | 440C                                                                    |   |   |     |    |   |   |   |    |   |    |
| <b>E</b>                                                       | PH13.8                                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>Basic designation</b> _____                                 |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>Bore code</b> (multiples of 1/16 inch) _____                |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>Chamfer and groove</b> _____                                |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code<sup>3)</sup></b>                                    | Chamfered outer ring                                                    |   |   |     |    |   |   |   |    |   |    |
| <b>R</b>                                                       | Grooved outer ring                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>Starting torque</b> _____                                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                                 | Standard                                                                |   |   |     |    |   |   |   |    |   |    |
| <b>XS<sup>1)</sup></b>                                         | Standard, SKF precision                                                 |   |   |     |    |   |   |   |    |   |    |
| <b>X</b>                                                       | Reduced                                                                 |   |   |     |    |   |   |   |    |   |    |
| <b>Shield and seal</b> _____                                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                                 | No shield and seal                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>TT<sup>2)</sup></b>                                         | Sealed                                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>PP<sup>2)</sup></b>                                         | Shielded                                                                |   |   |     |    |   |   |   |    |   |    |
| <b>Material and surface treatment of inner ring code</b> _____ |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                                 | Passivated inner ring                                                   |   |   |     |    |   |   |   |    |   |    |
| <b>F<sup>1)</sup></b>                                          | Chromium plated sphere                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>D<sup>1)</sup></b>                                          | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |   |   |    |   |    |
| <b>K<sup>1) 4)</sup></b>                                       | XLHP coated sphere                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>N<sup>1) 4)</sup></b>                                       | XLNT coated sphere                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>H<sup>1) 4)</sup></b>                                       | XL coated sphere                                                        |   |   |     |    |   |   |   |    |   |    |
| <b>Oversize</b> _____                                          |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                                 | Standard outer diameter size                                            |   |   |     |    |   |   |   |    |   |    |
| <b>Y2</b>                                                      | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |    |   |   |   |    |   |    |
| <b>Y4</b>                                                      | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |    |   |   |   |    |   |    |

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, only available for  $d \geq 5$

<sup>3)</sup> SKF option for code 7A

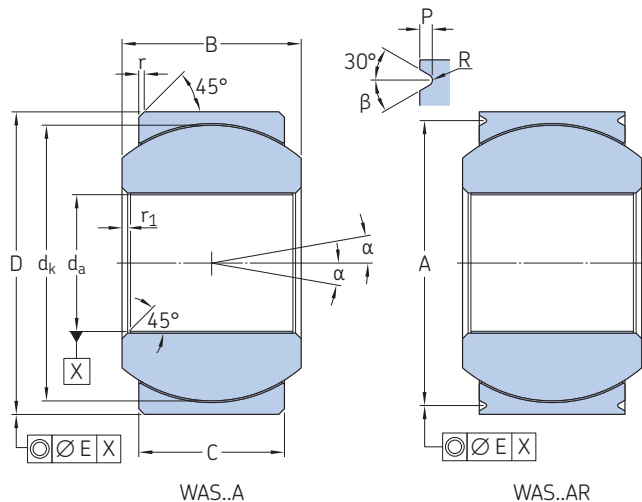
<sup>4)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

<sup>4)</sup> If starting torque is  $\leq 0.1$  lbf-in (0,01 Nm), maximum internal clearance must be:

| Nominal bore code | Maximum radial clearance | Maximum axial clearance |
|-------------------|--------------------------|-------------------------|
| -                 | in/mm                    |                         |
| $\leq 12$         | 0.0007/0,0178            | 0.0021/0,0533           |
| $\geq 14$         | 0.0010/0,0254            | 0.0030/0,0762           |

## 2.30 Self-lubricating wide (inch dimensions)

WAS..A (XRL..A., 11LHW.. or 11LBW..) bore code **10** to **32**



|                                |                                                                                            |
|--------------------------------|--------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81820                                                                                   |
| <b>Product standards</b>       | AS 81820/2 (lined bore chamfered outer ring)<br>AS 81820/3 (lined bore grooved outer ring) |
| <b>Materials</b>               |                                                                                            |
| Liner                          | X1                                                                                         |
| Inner ring                     | Passivated corrosion-resistant steel<br>440C or PH13.8                                     |
| Outer ring                     | Corrosion-resistant steel 17-4PH                                                           |

| $\beta$ | E           |
|---------|-------------|
| °       | in/mm       |
| 30      | 0.006/0,152 |

### Dimensions

| Nominal<br>bore<br>code | Size  | Dimensions             |                        |                            |                      |           |              |                      |                      |                      |             | $\alpha^{(4)}$ |
|-------------------------|-------|------------------------|------------------------|----------------------------|----------------------|-----------|--------------|----------------------|----------------------|----------------------|-------------|----------------|
|                         |       | $d_a$                  | D                      | C                          | B                    | $d_k$     | $r_1$<br>max | r                    | A                    | P                    | R           |                |
|                         |       | 0/-0.0010<br>0/-0,0254 | 0/-0.0005<br>0/-0,0127 | $\pm 0.005$<br>$\pm 0,127$ | 0/-0.002<br>0/-0,051 | $\approx$ |              | +0.010/0<br>+0,254/0 | 0/-0.008<br>0/-0,203 | 0/-0.010<br>0/-0,254 |             |                |
| —                       |       | in/mm                  |                        |                            |                      |           |              |                      |                      |                      |             | °              |
| 10                      | 5/8   | 0.6260                 | 1.1875                 | 0.567                      | 0.750                | 1.059     | 0.010        | 0.020                | 1.087                | 0.035                | 0.010/0.017 | 12             |
|                         |       | 15,900                 | 30,163                 | 14,400                     | 19,050               | 26,887    | 0,254        | 0,508                | 27,610               | 0,889                | 0,254/0,432 |                |
| 12                      | 3/4   | 0.7510                 | 1.3750                 | 0.630                      | 0.875                | 1.216     | 0.005        | 0.030                | 1.251                | 0.055                | 0.010/0.017 | 13             |
|                         |       | 19,075                 | 34,925                 | 16,002                     | 22,225               | 30,897    | 0,127        | 0,762                | 31,775               | 1,397                | 0,254/0,432 |                |
| 14                      | 7/8   | 0.8760                 | 1.6250                 | 0.755                      | 0.875                | 1.325     | 0.005        | 0.030                | 1.501                | 0.055                | 0.010/0.017 | 6              |
|                         |       | 22,250                 | 41,275                 | 19,177                     | 22,225               | 33,655    | 0,127        | 0,762                | 38,125               | 1,397                | 0,254/0,432 |                |
| 16                      | 1     | 1.0010                 | 2.1250                 | 1.005                      | 1.375                | 1.871     | 0.005        | 0.030                | 2.001                | 0.055                | 0.010/0.017 | 12             |
|                         |       | 25,425                 | 53,975                 | 25,527                     | 34,925               | 47,526    | 0,127        | 0,762                | 50,825               | 1,397                | 0,254/0,432 |                |
| 20 <sup>(1)</sup>       | 1 1/4 | 1.2510                 | 2.3750                 | 1.130                      | 1.500                | 2.095     | 0.005        | 0.030                | 2.253                | 0.060                | 0.010/0.020 | 12             |
|                         |       | 31,775                 | 60,325                 | 28,702                     | 38,100               | 53,203    | 0,127        | 0,762                | 57,230               | 1,524                | 0,254/0,508 |                |
| 24 <sup>(1)</sup>       | 1 1/2 | 1.5010                 | 2.6875                 | 1.223                      | 1.687                | 2.393     | 0.005        | 0.030                | 2.565                | 0.060                | 0.010/0.020 | 12             |
|                         |       | 38,125                 | 68,260                 | 31,064                     | 42,850               | 60,779    | 0,127        | 0,762                | 65,160               | 1,524                | 0,254/0,508 |                |
| 28 <sup>(1)</sup>       | 1 3/4 | 1.7510                 | 3.0000                 | 1.317                      | 1.812                | 2.673     | 0.005        | 0.030                | 2.878                | 0.060                | 0.010/0.020 | 12             |
|                         |       | 44,475                 | 76,200                 | 33,452                     | 46,020               | 67,892    | 0,127        | 0,762                | 73,100               | 1,524                | 0,254/0,508 |                |
| 32 <sup>(1)</sup>       | 2     | 2.0010                 | 3.2500                 | 1.380                      | 1.937                | 2.938     | 0.005        | 0.030                | 3.128                | 0.060                | 0.010/0.020 | 12             |
|                         |       | 50,825                 | 82,550                 | 35,050                     | 49,190               | 74,624    | 0,127        | 0,762                | 79,451               | 1,524                | 0,254/0,508 |                |

### Loads and torque

| Nominal bore code       | Size         | Mass $\approx$ | Static limit loads | Radial dynamic load | Starting torque <sup>(4)</sup> |                   |                            |
|-------------------------|--------------|----------------|--------------------|---------------------|--------------------------------|-------------------|----------------------------|
|                         |              |                | Radial $C_s$       | Axial $C_a^{(3)}$   | C25                            | Standard          | Standard, SKF precision    |
|                         |              | lb/g           | lbf/kN             |                     |                                | lbf-in/Nm         | Reduced <sup>(4)</sup> max |
| <b>10</b>               | <b>5/8</b>   | 0.16<br>73     | 29 000<br>129,00   | 6 130<br>27,28      | 20 250<br>90,11                | 1/15<br>0,11/1,69 | 1/5<br>0,11/0,56           |
| <b>12</b>               | <b>3/4</b>   | 0.24<br>109    | 37 000<br>164,65   | 7 730<br>34,40      | 26 200<br>116,59               | 1/15<br>0,11/1,69 | 1/5<br>0,11/0,56           |
| <b>14</b>               | <b>7/8</b>   | 0.35<br>159    | 65 200<br>290,14   | 10 800<br>48,06     | 33 600<br>149,52               | 1/25<br>0,11/2,82 | 2/8<br>0,23/0,9            |
| <b>16</b>               | <b>1</b>     | 0.97<br>440    | 104 000<br>462,80  | 19 300<br>85,88     | 56 250<br>250,31               | 1/25<br>0,11/2,82 | 2/8<br>0,23/0,9            |
| <b>20<sup>(1)</sup></b> | <b>1 1/4</b> | 1.10<br>500    | 127 890<br>568,40  | 26 080<br>115,91    | 66 450<br>295,57               | 2/20<br>0,23/2,26 | 2.4/15.5<br>0,28/1,75      |
| <b>24<sup>(1)</sup></b> | <b>1 1/2</b> | 1.54<br>700    | 158 850<br>706,00  | 30 989<br>137,73    | 82 536<br>367,12               | 2/20<br>0,23/2,26 | 2.4/15.5<br>0,28/1,75      |
| <b>28<sup>(1)</sup></b> | <b>1 3/4</b> | 1.99<br>900    | 193 374<br>859,44  | 36 934<br>161,75    | 72 410<br>445,60               | 10/35<br>1,3/3,9  | 4.5/19<br>0,5/2,15         |
| <b>32<sup>(1)</sup></b> | <b>2</b>     | 2.31<br>1 050  | 224 136<br>996,16  | 40 449<br>180,00    | 116 457<br>518,00              | 10/35<br>1,3/3,9  | 4.5/19<br>0,5/2,15         |

<sup>(1)</sup> SKF option <sup>(2)</sup> Parts are delivered and marked with SKF standard XRL..A., 11LHW (inner ring spherical surface coated) or 11LBW.. references.

<sup>(3)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>(4)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



### Cross-reference designation system to XRE..A, 11LHN.. or 11LBN..

|                                                          |                                                                         |   |   |     |    |   |   |   |    |   |    |
|----------------------------------------------------------|-------------------------------------------------------------------------|---|---|-----|----|---|---|---|----|---|----|
| Examples:                                                | ZWAS12ARXTTFY2                                                          | Z | E | WAS | 12 | A | R | X | TT | F | Y2 |
|                                                          | WAS 3APPD                                                               |   |   |     |    |   |   |   |    |   |    |
| <b>Surface treatment of outer ring</b>                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Not plated                                                              |   |   |     |    |   |   |   |    |   |    |
| <b>Z</b>                                                 | Cadmium plated external dimensions                                      |   |   |     |    |   |   |   |    |   |    |
| <b>SZ</b>                                                | Zinc-nickel plated external dimensions                                  |   |   |     |    |   |   |   |    |   |    |
| <b>Inner ring material</b>                               |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | 440C                                                                    |   |   |     |    |   |   |   |    |   |    |
| <b>E</b>                                                 | PH13.8                                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>Basic designation</b>                                 |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>Bore code</b> (multiples of 1/16 inch)                |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>Chamfer and groove</b>                                |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code<sup>3)</sup></b>                              | Chamfered outer ring                                                    |   |   |     |    |   |   |   |    |   |    |
| <b>R</b>                                                 | Grooved outer ring                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>Starting torque</b>                                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Standard                                                                |   |   |     |    |   |   |   |    |   |    |
| <b>XS<sup>1)</sup></b>                                   | Standard, SKF precision                                                 |   |   |     |    |   |   |   |    |   |    |
| <b>X</b>                                                 | Reduced                                                                 |   |   |     |    |   |   |   |    |   |    |
| <b>Shield and seal</b>                                   |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | No shield and seal                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>TT<sup>2)</sup></b>                                   | Sealed                                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>PP<sup>2)</sup></b>                                   | Shielded                                                                |   |   |     |    |   |   |   |    |   |    |
| <b>Material and surface treatment of inner ring code</b> |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Passivated inner ring                                                   |   |   |     |    |   |   |   |    |   |    |
| <b>F<sup>1)</sup></b>                                    | Chromium plated sphere                                                  |   |   |     |    |   |   |   |    |   |    |
| <b>D<sup>1)</sup></b>                                    | XCR plating on sphere (chromium 6 free replacement to chromium plating) |   |   |     |    |   |   |   |    |   |    |
| <b>K<sup>1) 4)</sup></b>                                 | XLHP coated sphere                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>N<sup>1) 4)</sup></b>                                 | XLNT coated sphere                                                      |   |   |     |    |   |   |   |    |   |    |
| <b>H<sup>1) 4)</sup></b>                                 | XL coated sphere                                                        |   |   |     |    |   |   |   |    |   |    |
| <b>Oversize</b>                                          |                                                                         |   |   |     |    |   |   |   |    |   |    |
| <b>No code</b>                                           | Standard outer diameter size                                            |   |   |     |    |   |   |   |    |   |    |
| <b>Y2</b>                                                | 0.010 in/0,254 mm oversized outer diameter                              |   |   |     |    |   |   |   |    |   |    |
| <b>Y4</b>                                                | 0.020 in/0,508 mm oversized outer diameter                              |   |   |     |    |   |   |   |    |   |    |

<sup>1)</sup> SKF option

<sup>2)</sup> SKF option, only available for  $d \geq 5$

<sup>3)</sup> SKF option for code 7A

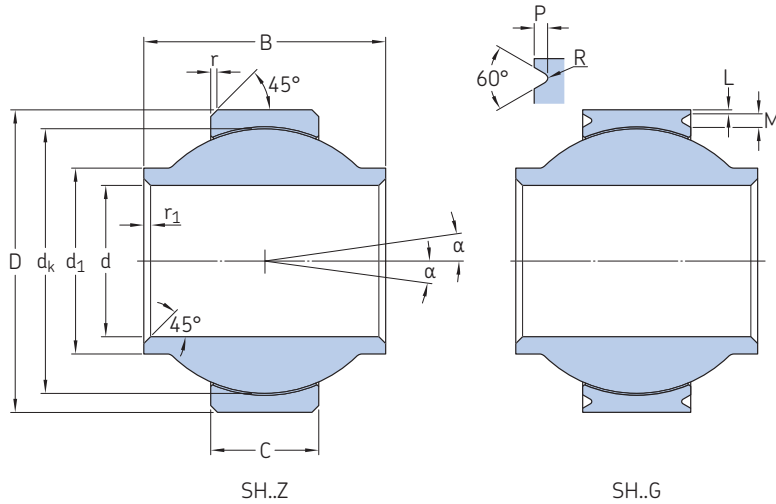
<sup>4)</sup> For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

<sup>4)</sup> If starting torque is  $\leq 0.1$  lbf-in (0,01 Nm), maximum internal clearance must be:

| Nominal bore code | Maximum radial clearance | Maximum axial clearance |
|-------------------|--------------------------|-------------------------|
| -                 | in/mm                    |                         |
| $\leq 12$         | 0.0007/0,0178            | 0.0021/0,0533           |
| $\geq 14$         | 0.0010/0,0254            | 0.0030/0,0762           |

## 2.31 Self-lubricating high misalignment (inch dimensions)

SH..



**Technical specification** –

**Product standards** –

**Materials**

Liner X1  
Inner ring Corrosion-resistant steel 440C  
Outer ring Corrosion-resistant steel 17-4PH

| Nominal bore code | L<br>+0.010/0<br>+0.254/0 | M<br>+0.010/0<br>+0.254/0 |
|-------------------|---------------------------|---------------------------|
| –                 | in/mm                     |                           |
| ≤ 04              | 0.010/0,254               | 0.035/0,889               |
| 05 to 08          | 0.020/0,508               | 0.045/1,143               |
| ≥ 10              | 0.020/0,508               | 0.070/1,778               |

### Dimensions

| Nominal bore code | Size         | Dimensions                  |                             |                           |                           |                     |                     |                           |                                        |                           |                         |        |
|-------------------|--------------|-----------------------------|-----------------------------|---------------------------|---------------------------|---------------------|---------------------|---------------------------|----------------------------------------|---------------------------|-------------------------|--------|
|                   |              | d<br>0/–0.0005<br>0/–0,0127 | D<br>0/–0.0005<br>0/–0,0127 | C<br>0/–0.010<br>0/–0,254 | B<br>0/–0.002<br>0/–0,051 | d <sub>k</sub><br>≈ | d <sub>1</sub><br>≈ | r<br>0/–0.010<br>0/–0,254 | r <sub>1</sub><br>+0.010/0<br>+0,254/0 | P<br>+0.015/0<br>+0,381/0 | R<br>0/0.010<br>0/0,254 | α<br>° |
| –                 |              | in/mm                       |                             |                           |                           |                     |                     |                           |                                        |                           |                         |        |
| <b>03</b>         | <b>3/16</b>  | 0.1900<br>4,8260            | 0.6250<br>15,8750           | 0.332<br>8,433            | 0.560<br>14,224           | 0.531<br>13,487     | 0.28<br>7,112       | 0.035<br>0,889            | 0.005<br>0,127                         | 0.015<br>0,381            | 0.005<br>0,127          | 15     |
| <b>04</b>         | <b>1/4</b>   | 0.2500<br>6,3500            | 0.7400<br>18,7960           | 0.260<br>6,604            | 0.593<br>15,062           | 0.593<br>15,062     | 0.35<br>8,890       | 0.035<br>0,889            | 0.005<br>0,127                         | 0.015<br>0,381            | 0.005<br>0,127          | 24     |
| <b>05</b>         | <b>5/16</b>  | 0.3125<br>7,9375            | 0.9060<br>23,0124           | 0.350<br>8,890            | 0.813<br>20,650           | 0.781<br>19,837     | 0.48<br>12,192      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.025<br>0,635            | 0.010<br>0,254          | 22     |
| <b>06</b>         | <b>3/8</b>   | 0.3750<br>9,5250            | 0.9060<br>23,0124           | 0.350<br>8,890            | 0.813<br>20,650           | 0.781<br>19,837     | 0.48<br>12,192      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.025<br>0,635            | 0.010<br>0,254          | 22     |
| <b>07</b>         | <b>7/16</b>  | 0.4375<br>11,1125           | 1.0000<br>25,4000           | 0.350<br>8,890            | 0.875<br>22,225           | 0.875<br>22,225     | 0.57<br>14,478      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.025<br>0,635            | 0.010<br>0,254          | 22     |
| <b>08</b>         | <b>1/2</b>   | 0.5000<br>12,7000           | 1.1250<br>28,5750           | 0.406<br>10,312           | 0.937<br>23,800           | 1.000<br>25,400     | 0.68<br>17,272      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.025<br>0,635            | 0.010<br>0,254          | 20     |
| <b>10</b>         | <b>5/8</b>   | 0.6250<br>15,8750           | 1.3750<br>34,9250           | 0.572<br>14,529           | 1.200<br>30,480           | 1.250<br>31,750     | 0.81<br>20,574      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.045<br>1,143            | 0.010<br>0,254          | 20     |
| <b>12</b>         | <b>3/4</b>   | 0.7500<br>19,0500           | 1.5625<br>39,6875           | 0.625<br>15,875           | 1.280<br>32,512           | 1.375<br>34,925     | 0.92<br>23,368      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.045<br>1,143            | 0.010<br>0,254          | 19     |
| <b>14</b>         | <b>7/8</b>   | 0.8750<br>22,2250           | 1.7500<br>44,4500           | 0.630<br>16,002           | 1.400<br>35,560           | 1.531<br>38,887     | 1.08<br>27,432      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.045<br>1,143            | 0.010<br>0,254          | 19     |
| <b>16</b>         | <b>1</b>     | 1.0000<br>25,4000           | 2.1250<br>53,9750           | 0.840<br>21,336           | 1.875<br>47,625           | 1.875<br>47,625     | 1.22<br>30,988      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.045<br>1,143            | 0.010<br>0,254          | 21     |
| <b>20</b>         | <b>1 1/4</b> | 1.2500<br>31,7500           | 2.5000<br>63,5000           | 1.010<br>25,654           | 1.875<br>47,625           | 2.250<br>57,150     | 1.50<br>38,100      | 0.035<br>0,889            | 0.005<br>0,127                         | 0.045<br>1,143            | 0.010<br>0,254          | 21     |



## Designation system

Examples: SH03GCY2  
SH10Z

### Basic designation

Bore code (multiples of 1/16 inch)

### Chamfer and groove

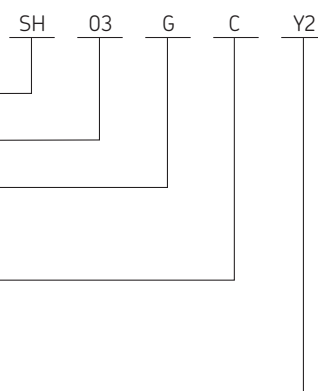
Z Chamfered outer ring  
G Grooved outer ring

### Surface treatment of outer ring

No code Not plated  
C Cadmium plated external dimensions  
J Zinc-nickel plated external dimensions

### Oversize

No code Standard outer diameter size  
Y1 0.005 in/0,127 mm oversized outer diameter  
Y2 0.010 in/0,254 mm oversized outer diameter  
Y3 0.015 in/0,381 mm oversized outer diameter  
Y4 0.020 in/0,508 mm oversized outer diameter



## Loads and torque

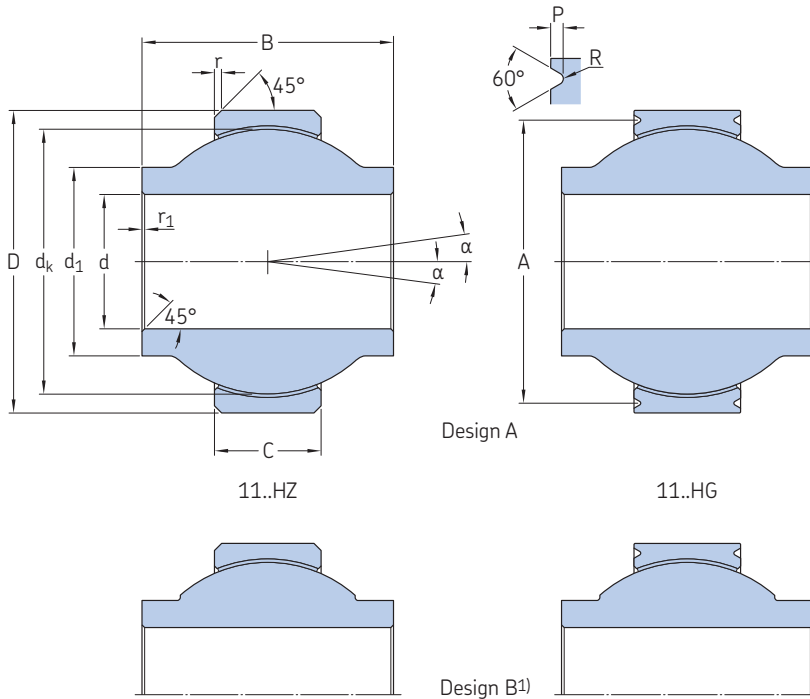
| Nominal bore code | Size  | Mass<br>≈     | Static limit loads       |                                       | No load dynamic torque <sup>2)</sup><br>Max |
|-------------------|-------|---------------|--------------------------|---------------------------------------|---------------------------------------------|
|                   |       |               | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>1)</sup> |                                             |
| –                 |       | lb/g          | lbf/kN                   |                                       | lbf-in/Nm                                   |
| 03                | 3/16  | 0,03<br>13,6  | 9 000<br>40,03           | 1 550<br>6,89                         | 5<br>0,56                                   |
| 04                | 1/4   | 0,04<br>18,1  | 7 000<br>31,14           | 600<br>2,67                           | 5<br>0,56                                   |
| 05                | 5/16  | 0,07<br>31,8  | 14 000<br>62,28          | 1 600<br>7,12                         | 5<br>0,56                                   |
| 06                | 3/8   | 0,07<br>31,8  | 14 000<br>62,28          | 1 600<br>7,12                         | 5<br>0,56                                   |
| 07                | 7/16  | 0,10<br>45,4  | 15 000<br>66,72          | 1 700<br>7,56                         | 8<br>0,90                                   |
| 08                | 1/2   | 0,16<br>72,6  | 20 000<br>88,96          | 2 500<br>11,12                        | 8<br>0,90                                   |
| 10                | 5/8   | 0,25<br>113,4 | 37 000<br>164,58         | 4 000<br>17,79                        | 8<br>0,90                                   |
| 12                | 3/4   | 0,32<br>145,1 | 45 500<br>202,39         | 4 800<br>21,35                        | 8<br>0,90                                   |
| 14                | 7/8   | 0,43<br>195,0 | 50 000<br>222,41         | 5 000<br>22,24                        | 8<br>0,90                                   |
| 16                | 1     | 0,81<br>367,4 | 85 000<br>378,10         | 11 100<br>49,38                       | 8<br>0,90                                   |
| 20                | 1 1/4 | 1,11<br>503,5 | 124 000<br>551,58        | 13 500<br>60,05                       | 20<br>2,26                                  |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> The minimum starting torque is limited by zero radial and axial internal clearance

## 2.32 Self-lubricating high misalignment (inch dimensions)

11..H



|                         |                                          |
|-------------------------|------------------------------------------|
| Technical specification | –                                        |
| Product standards       | –                                        |
| Materials               |                                          |
| Liner                   | X1                                       |
| Inner ring              | Corrosion-resistant steel 440C or PH13.8 |
| Outer ring              | Corrosion-resistant steel 17-4PH         |

### Dimensions

| Nominal bore code | Size  | Dimensions             | D                      | C                    | B                    | d <sub>k</sub>  | d <sub>1</sub>  | r                    | r <sub>1</sub>       | A                    |
|-------------------|-------|------------------------|------------------------|----------------------|----------------------|-----------------|-----------------|----------------------|----------------------|----------------------|
|                   |       | 0/-0.0005<br>0/-0,0127 | 0/-0.0005<br>0/-0,0127 | 0/-0.010<br>0/-0,254 | 0/-0.002<br>0/-0,051 |                 |                 | +0.010/0<br>+0,254/0 | +0.010/0<br>+0,254/0 | 0/-0.010<br>0/-0,254 |
| –                 |       | in/mm                  |                        |                      |                      |                 |                 |                      |                      |                      |
| 03                | 3/16  | 0.1900<br>4,8260       | 0.5625<br>14,2875      | 0.215<br>5,461       | 0.500<br>12,700      | 0.437<br>11,100 | 0.312<br>7,925  | 0.025<br>0,635       | 0.005<br>0,127       | 0.502<br>12,751      |
| 031               | 3/16  | 0.1900<br>4,8260       | 0.6250<br>15,8750      | 0.332<br>8,433       | 0.560<br>14,224      | 0.531<br>13,487 | 0.280<br>7,112  | 0.025<br>0,635       | 0.005<br>0,127       | 0.560<br>14,224      |
| 04                | 1/4   | 0.2500<br>6,3500       | 0.7400<br>18,7960      | 0.260<br>6,604       | 0.593<br>15,062      | 0.593<br>15,062 | 0.350<br>8,890  | 0.025<br>0,635       | 0.005<br>0,127       | 0.675<br>17,145      |
| 05                | 5/16  | 0.3125<br>7,9375       | 0.9060<br>23,0124      | 0.350<br>8,890       | 0.813<br>20,650      | 0.781<br>19,837 | 0.480<br>12,192 | 0.025<br>0,635       | 0.005<br>0,127       | 0.811<br>20,599      |
| 051               | 5/16  | 0.3125<br>7,9375       | 0.6875<br>17,4625      | 0.245<br>6,223       | 0.625<br>15,875      | 0.593<br>15,062 | 0.420<br>10,668 | 0.025<br>0,635       | 0.005<br>0,127       | 0.637<br>16,180      |
| 06                | 3/8   | 0.3750<br>9,5250       | 0.9060<br>23,0124      | 0.350<br>8,890       | 0.813<br>20,650      | 0.781<br>19,837 | 0.480<br>12,192 | 0.025<br>0,635       | 0.005<br>0,127       | 0.811<br>20,599      |
| 07                | 7/16  | 0.4375<br>11,1125      | 1.0000<br>25,4000      | 0.350<br>8,890       | 0.875<br>22,225      | 0.875<br>22,225 | 0.570<br>14,478 | 0.025<br>0,635       | 0.005<br>0,127       | 0.905<br>22,987      |
| 08                | 1/2   | 0.5000<br>12,7000      | 1.1250<br>28,5750      | 0.406<br>10,312      | 0.937<br>23,800      | 1.000<br>25,400 | 0.680<br>17,272 | 0.025<br>0,635       | 0.005<br>0,127       | 1.030<br>26,162      |
| 10                | 5/8   | 0.6250<br>15,8750      | 1.3750<br>34,9250      | 0.572<br>14,529      | 1.200<br>30,480      | 1.250<br>31,750 | 0.810<br>20,574 | 0.025<br>0,635       | 0.005<br>0,127       | 1.255<br>31,877      |
| 12                | 3/4   | 0.7500<br>19,0500      | 1.5625<br>39,6875      | 0.625<br>15,875      | 1.280<br>32,512      | 1.375<br>34,925 | 0.920<br>23,368 | 0.025<br>0,635       | 0.005<br>0,127       | 1.442<br>36,627      |
| 14                | 7/8   | 0.8750<br>22,2250      | 1.7500<br>44,4500      | 0.630<br>16,002      | 1.400<br>35,560      | 1.531<br>38,887 | 1.080<br>27,432 | 0.025<br>0,635       | 0.005<br>0,127       | 1.630<br>41,402      |
| 16                | 1     | 1.0000<br>25,4000      | 2.1250<br>53,9750      | 0.840<br>21,336      | 1.875<br>47,625      | 1.875<br>47,625 | 1.220<br>30,988 | 0.025<br>0,635       | 0.005<br>0,127       | 2.005<br>50,927      |
| 20                | 1 1/4 | 1.2500<br>31,7500      | 2.5000<br>63,5000      | 1.010<br>25,654      | 1.875<br>47,625      | 2.250<br>57,150 | 1.500<br>38,100 | 0.025<br>0,635       | 0.005<br>0,127       | 2.380<br>60,452      |
| 24                | 1 1/2 | 1.5000<br>38,1000      | 3.0000<br>76,2000      | 1.180<br>29,972      | 2.250<br>57,150      | 2.672<br>67,869 | 1.802<br>45,771 | 0.025<br>0,635       | 0.005<br>0,127       | 2.880<br>73,152      |

<sup>1)</sup> Slight reduction of misalignment angle  $\alpha$  (contact SKF for more information)





## Designation system

Examples: 11BHGO3EXCY2  
11HHZ10J

11 B H G 03 E X C Y2

### Basic designation

#### Coating of inner ring

B Passivated (Design A)  
H XL coated sphere (Design B)  
K XLHP coated sphere (Design A)  
N XLNT coated sphere (Design B)  
D XCR plating on sphere (chromium 6 free replacement to chromium plating) (Design A)

#### Chamfer and groove

Z Chamfered outer ring  
G Grooved outer ring

#### Bore code (multiples of 1/16 inch)

#### Inner ring material

No code 440C  
E PH13.8

#### Starting torque

No code Standard  
X Reduced

#### Surface treatment of outer ring

No code Not plated  
C Cadmium plated external dimensions  
J Zinc-nickel plated external dimensions

#### Over-size

No code Standard outer diameter size  
Y1 0.005 in / 0.127 mm oversized outer diameter  
Y2 0.010 in / 0.254 mm oversized outer diameter  
Y3 0.015 in / 0.381 mm oversized outer diameter  
Y4 0.020 in / 0.508 mm oversized outer diameter

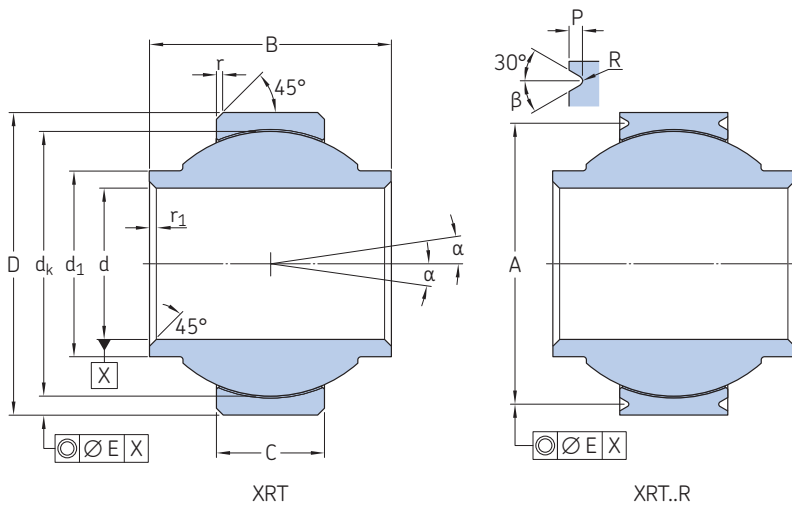
## Dimensions cont., loads and torque

| Nominal<br>bore<br>code | Size  | Dimensions                |                           | α <sup>1)</sup> | Mass<br>≈       | Static limit loads       |                                       | Starting torque       |                       |
|-------------------------|-------|---------------------------|---------------------------|-----------------|-----------------|--------------------------|---------------------------------------|-----------------------|-----------------------|
|                         |       | P<br>0/−0.015<br>0/−0,381 | R<br>0/−0.010<br>0/−0,254 |                 |                 | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>2)</sup> | Standard              | Reduced <sup>3)</sup> |
| —                       |       | in/mm                     |                           | °               | lb/g            | lbf/kN                   |                                       | lbf-in/Nm             |                       |
| 03                      | 3/16  | 0.030<br>0,762            | 0.015<br>0,381            | 15              | 0.02<br>9,1     | 4 970<br>22,11           | 315<br>1,40                           | 0.25/5.0<br>0,03/0,56 | 0.5<br>0,06           |
| 031                     | 3/16  | 0.030<br>0,762            | 0.015<br>0,381            | 15              | 0.03<br>13,6    | 10 500<br>46,71          | 1 785<br>7,94                         | 0.25/5.0<br>0,03/0,56 | 0.5<br>0,06           |
| 04                      | 1/4   | 0.030<br>0,762            | 0.015<br>0,381            | 24              | 0.04<br>18,1    | 8 120<br>36,12           | 700<br>3,11                           | 0.25/5.0<br>0,03/0,56 | 0.5<br>0,06           |
| 05                      | 5/16  | 0.040<br>1,016            | 0.020<br>0,508            | 22              | 0.07<br>31,8    | 16 310<br>72,55          | 1 855<br>8,25                         | 0.25/5.0<br>0,03/0,56 | 1<br>0,11             |
| 051                     | 5/16  | 0.030<br>0,762            | 0.015<br>0,381            | 20              | 0.03<br>13,6    | 7 910<br>35,19           | 525<br>2,34                           | 0.25/5.0<br>0,03/0,56 | 1<br>0,11             |
| 06                      | 3/8   | 0.040<br>1,016            | 0.020<br>0,508            | 22              | 0.07<br>31,8    | 16 310<br>72,55          | 1 855<br>8,25                         | 0.25/5.0<br>0,03/0,56 | 1<br>0,11             |
| 07                      | 7/16  | 0.040<br>1,016            | 0.020<br>0,508            | 22              | 0.10<br>45,4    | 17 500<br>77,84          | 1 960<br>8,72                         | 0.50/8.0<br>0,06/0,9  | 1<br>0,11             |
| 08                      | 1/2   | 0.040<br>1,016            | 0.020<br>0,508            | 20              | 0.16<br>72,6    | 23 310<br>103,69         | 2 905<br>12,92                        | 0.50/8.0<br>0,06/0,9  | 1<br>0,11             |
| 10                      | 5/8   | 0.060<br>1,524            | 0.020<br>0,508            | 20              | 0.25<br>113,4   | 43 120<br>191,81         | 6 600<br>29,36                        | 1.0/8.0<br>0,11/0,90  | 1<br>0,11             |
| 12                      | 3/4   | 0.060<br>1,524            | 0.020<br>0,508            | 19              | 0.32<br>145,1   | 53 060<br>236,02         | 7 700<br>34,25                        | 1.0/8.0<br>0,11/0,90  | 1<br>0,11             |
| 14                      | 7/8   | 0.060<br>1,524            | 0.020<br>0,508            | 19              | 0.43<br>195,0   | 58 310<br>259,38         | 7 700<br>34,25                        | 1.0/8.0<br>0,11/0,90  | 2<br>0,23             |
| 16                      | 1     | 0.060<br>1,524            | 0.020<br>0,508            | 21              | 0.81<br>367,4   | 99 120<br>440,91         | 15 400<br>68,50                       | 2.0/12.0<br>0,23/1,36 | 2<br>0,23             |
| 20                      | 1 1/4 | 0.060<br>1,524            | 0.020<br>0,508            | 21              | 1.11<br>503,5   | 144 620<br>643,30        | 23 100<br>102,75                      | 2.0/20.0<br>0,23/2,26 | 2<br>0,23             |
| 24                      | 1 1/2 | 0.060<br>1,524            | 0.020<br>0,508            | 21              | 2.22<br>1 007,0 | 211 330<br>940,04        | 27 930<br>124,24                      | 2.0/20.0<br>0,23/2,26 | 2<br>0,23             |

<sup>1)</sup> Values are valid for design A. For design B, the misalignment angle  $\alpha$  is slightly reduced (contact SKF for more information) <sup>2)</sup> These values can be limited by the unstaking load (contact SKF for more information) <sup>3)</sup> The minimum starting torque is limited by zero radial and axial internal clearance

## 2.33 Self-lubricating high misalignment (inch dimensions)

XRT.. bore code 4,83 to 12,7



|                         |                                          |
|-------------------------|------------------------------------------|
| Technical specification | –                                        |
| Product standards       | –                                        |
| Materials               |                                          |
| Liner                   | X1                                       |
| Inner ring              | Corrosion-resistant steel 440C or PH13.8 |
| Outer ring              | Corrosion-resistant steel 17-4PH         |

| d                             | β  | E              |
|-------------------------------|----|----------------|
| in/mm                         | °  | in/mm          |
| 0.1900/0.4375<br>4,826/11,113 | 20 | 0.005<br>0,127 |
| 0.5000/1.2500<br>12,7/31,75   | 30 | 0.005<br>0,127 |

### Dimensions

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions<br>d<br>Bore without liner<br>0/-0.0005<br>0/-0,0127 | d <sub>a</sub><br>= d with lined bore<br>+ 0.0010/0<br>+ 0,0250/0 | D                | C               | B               | d <sub>k</sub>  | d <sub>1</sub>  | r <sub>1</sub> | r              | A               | P              |
|-------------------|---------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------|------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|-----------------|----------------|
| –                 |                                       | in/mm                                                           |                                                                   |                  |                 |                 |                 |                 |                |                |                 |                |
| 4,83              | 03                                    | 0.1900<br>4,826                                                 | 0.1900<br>4,826                                                   | 0.5625<br>14,288 | 0.205<br>5,207  | 0.500<br>12,700 | 0.437<br>11,100 | 0.315<br>8,001  | 0.004<br>0,100 | 0.020<br>0,508 | 0.502<br>12,751 | 0.030<br>0,762 |
| 6,35              | 04                                    | 0.2500<br>6,350                                                 | 0.2500<br>6,350                                                   | 0.7400<br>18,796 | 0.250<br>6,350  | 0.593<br>15,062 | 0.594<br>15,080 | 0.386<br>9,804  | 0.004<br>0,100 | 0.020<br>0,508 | 0.669<br>17,000 | 0.030<br>0,762 |
| 7,94              | 05                                    | 0.3125<br>7,938                                                 | 0.3125<br>7,938                                                   | 0.9060<br>23,012 | 0.340<br>8,636  | 0.813<br>20,650 | 0.781<br>19,838 | 0.512<br>13,005 | 0.004<br>0,100 | 0.020<br>0,508 | 0.831<br>21,100 | 0.030<br>0,762 |
| 9,52              | 06                                    | 0.3750<br>9,525                                                 | 0.3750<br>9,525                                                   | 0.9060<br>23,012 | 0.340<br>8,636  | 0.813<br>20,650 | 0.781<br>19,838 | 0.532<br>13,513 | 0.004<br>0,100 | 0.020<br>0,508 | 0.831<br>21,100 | 0.030<br>0,762 |
| 11,11             | 07                                    | 0.4375<br>11,113                                                | 0.4375<br>11,113                                                  | 1.0000<br>25,400 | 0.340<br>8,636  | 0.875<br>22,225 | 0.866<br>22,000 | 0.620<br>15,748 | 0.004<br>0,100 | 0.020<br>0,508 | 0.925<br>23,500 | 0.030<br>0,762 |
| 12,7              | 08                                    | 0.5000<br>12,700                                                | 0.5000<br>12,700                                                  | 1.1250<br>28,575 | 0.396<br>10,058 | 0.937<br>23,799 | 0.984<br>25,000 | 0.728<br>18,491 | 0.004<br>0,100 | 0.020<br>0,508 | 1.047<br>26,600 | 0.030<br>0,762 |

### Dimensions cont., loads and torque

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions<br>R            | α <sup>2)</sup> | Mass<br>≈  | Static limit loads<br>Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> <sup>1)</sup> | Radial dynamic load<br>C <sub>25</sub> | Starting torque <sup>2)</sup><br>Standard | Reduced<br>Max |
|-------------------|---------------------------------------|----------------------------|-----------------|------------|------------------------------------------------|---------------------------------------|----------------------------------------|-------------------------------------------|----------------|
| –                 |                                       | in/mm                      | °               | lb/g       | lbf/kN                                         |                                       |                                        | lbf-in/Nm                                 |                |
| 4,83              | 03                                    | 0.005/0.010<br>0,127/0,254 | 15              | 0.02<br>9  | 3 642<br>16,2                                  | 899<br>4,0                            | 1 461<br>6,5                           | 0.5/2.5<br>0,06/0,28                      | 0.5<br>0,06    |
| 6,35              | 04                                    | 0.005/0.010<br>0,127/0,254 | 24              | 0.04<br>18 | 6 924<br>30,8                                  | 517<br>2,3                            | 2 765<br>12,3                          | 0.5/2.5<br>0,06/0,28                      | 0.5<br>0,06    |
| 7,94              | 05                                    | 0.005/0.010<br>0,127/0,254 | 23              | 0.07<br>32 | 12 544<br>55,8                                 | 1 304<br>5,8                          | 5 013<br>22,3                          | 0.7/3.5<br>0,080/0,40                     | 1<br>0,11      |
| 9,52              | 06                                    | 0.005/0.010<br>0,127/0,254 | 22              | 0.07<br>32 | 12 544<br>55,8                                 | 1 304<br>5,8                          | 5 013<br>22,3                          | 0.9/4.5<br>0,10/0,51                      | 1<br>0,11      |
| 11,11             | 07                                    | 0.005/0.010<br>0,127/0,254 | 22              | 0.10<br>45 | 13 286<br>59,1                                 | 1 394<br>6,2                          | 5 305<br>23,6                          | 0.9/4.5<br>0,10/0,51                      | 1<br>0,11      |
| 12,7              | 08                                    | 0.005/0.010<br>0,127/0,254 | 20              | 0.16<br>73 | 18 906<br>84,1                                 | 2 360<br>10,5                         | 7 553<br>33,6                          | 0.9/4.5<br>0,10/0,51                      | 1<br>0,11      |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



## Designation system

Examples: ZXRT19,05ARXTTCP33RP01  
XRT 4,83PPCP109

Z XRT 19,05 A R X TT CP33 RP01

### Surface treatment of outer ring

**No code** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

### Basic designation

### Bore code

### Lined bore

**No code** Bore without liner  
**A<sup>1)</sup>** Lined bore

### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

### Starting torque

**No code** Standard  
**X** Reduced

### Shield and seal

**No code** No shield and seal  
**TT<sup>2)</sup>** Sealed  
**PP<sup>2)</sup>** Shielded

### Material and surface treatment of inner ring

|                | Material | Surface treatment                                                       |
|----------------|----------|-------------------------------------------------------------------------|
| <b>No code</b> | 440C     | –                                                                       |
| <b>CP6</b>     | 440C     | Chromium plated sphere                                                  |
| <b>CP109</b>   | 440C     | XCR plating on sphere (chromium 6 free replacement to chromium plating) |
| <b>CP55</b>    | 440C     | Passivated inner ring                                                   |
| <b>CP33</b>    | PH13.8   | –                                                                       |
| <b>CP194</b>   | PH13.8   | Chromium plated sphere                                                  |
| <b>CP195</b>   | PH13.8   | XCR plating on sphere (chromium 6 free replacement to chromium plating) |
| <b>CP196</b>   | PH13.8   | Passivated inner ring                                                   |

### Oversize

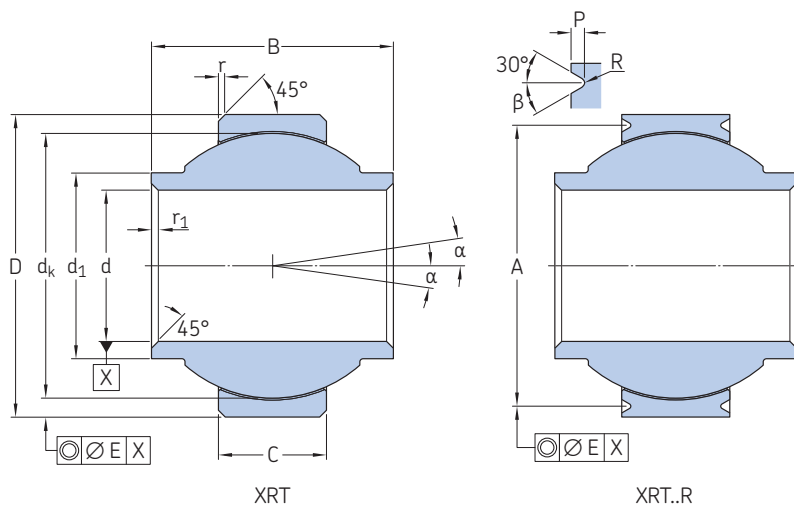
**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> Only available for  $d \geq 6$

<sup>2)</sup> Only available for  $d \geq 7,94$

## 2.33 Self-lubricating high misalignment (inch dimensions)

XRT.. bore code **15,87** to **31,75**



|                                |                                          |
|--------------------------------|------------------------------------------|
| <b>Technical specification</b> | –                                        |
| <b>Product standards</b>       | –                                        |
| <b>Materials</b>               |                                          |
| Liner                          | X1                                       |
| Inner ring                     | Corrosion-resistant steel 440C or PH13.8 |
| Outer ring                     | Corrosion-resistant steel 17-4PH         |

| d                             | β  | E              |
|-------------------------------|----|----------------|
| in/mm                         | °  | in/mm          |
| 0.1900/0.4375<br>4,826/11,113 | 20 | 0.005<br>0,127 |
| 0.5000/1.2500<br>12,7/31,75   | 30 | 0.005<br>0,127 |

### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d<br>Bore without liner<br>0/-0.0005<br>0/-0,0127 | da<br>= d with lined bore<br>+ 0.0010/0<br>+ 0,0250/0 | D                | C               | B               | dk              | d1              | r1             | r              | A               | P              |
|-------------------|------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|-----------------|----------------|
| –                 | –                                  | in/mm                                                        |                                                       |                  |                 |                 |                 |                 |                |                |                 |                |
| <b>15,87</b>      | <b>10</b>                          | 0.6250<br>15,875                                             | 0.6250<br>15,875                                      | 1.3750<br>34,925 | 0.562<br>14,275 | 1.200<br>30,480 | 1.240<br>31,500 | 0.857<br>21,768 | 0.004<br>0,100 | 0.020<br>0,508 | 1.268<br>32,200 | 0.040<br>1,016 |
| <b>19,05</b>      | <b>12</b>                          | 0.7500<br>19,050                                             | 0.7500<br>19,050                                      | 1.5625<br>39,688 | 0.615<br>15,621 | 1.280<br>32,512 | 1.339<br>34,000 | 0.963<br>24,460 | 0.004<br>0,100 | 0.020<br>0,508 | 1.437<br>36,500 | 0.060<br>1,524 |
| <b>22,22</b>      | <b>14</b>                          | 0.8750<br>22,225                                             | 0.8750<br>22,225                                      | 1.7500<br>44,450 | 0.620<br>15,748 | 1.400<br>35,560 | 1.531<br>38,887 | 1.122<br>28,500 | 0.004<br>0,100 | 0.020<br>0,508 | 1.624<br>41,250 | 0.060<br>1,524 |
| <b>25,4</b>       | <b>16</b>                          | 1.0000<br>25,400                                             | 1.0000<br>25,400                                      | 2.1250<br>53,975 | 0.830<br>21,082 | 1.875<br>47,625 | 1.875<br>47,625 | 1.272<br>32,309 | 0.004<br>0,100 | 0.020<br>0,508 | 2.003<br>50,876 | 0.060<br>1,524 |
| <b>31,75</b>      | <b>20</b>                          | 1.2500<br>31,750                                             | 1.2500<br>31,750                                      | 2.5000<br>63,500 | 1.000<br>25,400 | 1.875<br>47,625 | 2.250<br>57,150 | 1.523<br>38,684 | 0.004<br>0,100 | 0.020<br>0,508 | 2.370<br>60,200 | 0.060<br>1,524 |

### Dimensions cont., loads and torque

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions R               | α <sup>2)</sup> | Mass ≈      | Static limit loads<br>Radial Cs | Axial Ca <sup>1)</sup> | Radial dynamic load C25 | Starting torque <sup>2)</sup><br>Standard | Reduced Max |
|-------------------|------------------------------------|----------------------------|-----------------|-------------|---------------------------------|------------------------|-------------------------|-------------------------------------------|-------------|
| –                 | –                                  | in/mm                      | °               | lb/g        | lbf/kN                          |                        |                         | lbf-in/Nm                                 |             |
| <b>15,87</b>      | <b>10</b>                          | 0.010/0.020<br>0,254/0,508 | 20              | 0.25<br>114 | 34 080<br>151,6                 | 5 553<br>24,7          | 13 622<br>60,6          | 1/6.2<br>0,11/0,70                        | 1<br>0,11   |
| <b>19,05</b>      | <b>12</b>                          | 0.010/0.020<br>0,254/0,508 | 19              | 0.32<br>145 | 51 457<br>228,9                 | 6 362<br>28,3          | 20 592<br>91,6          | 1/6.2<br>0,11/0,70                        | 1<br>0,11   |
| <b>22,22</b>      | <b>14</b>                          | 0.010/0.020<br>0,254/0,508 | 19              | 0.43<br>195 | 61 708<br>274,5                 | 6 452<br>28,7          | 24 683<br>109,8         | 2.2/9<br>0,25/1,02                        | 2<br>0,23   |
| <b>25,4</b>       | <b>16</b>                          | 0.010/0.020<br>0,254/0,508 | 21              | 0.81<br>367 | 84 053<br>373,9                 | 12 206<br>54,3         | 33 608<br>149,5         | 2.2/9<br>0,25/1,02                        | 2<br>0,23   |
| <b>31,75</b>      | <b>20</b>                          | 0.010/0.020<br>0,254/0,508 | 21              | 1.11<br>504 | 119 301<br>530,7                | 19 355<br>86,1         | 47 703<br>212,2         | 3.5/16<br>0,395/1,808                     | 2.2<br>0,25 |

<sup>1)</sup> These values can be limited by the unstaking load (contact SKF for more information)

<sup>2)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



## Designation system

Examples: ZXRT19,05ARXTTCP33RP01  
XRT 4,83PPCP109

Z XRT 19,05 A R X TT CP33 RP01

### Surface treatment of outer ring

**No code** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

### Basic designation

#### Bore code

#### Lined bore

**No code** Bore without liner  
**A<sup>1)</sup>** Lined bore

### Chamfer and groove

**No code** Chamfered outer ring  
**R** Grooved outer ring

### Starting torque

**No code** Standard  
**X** Reduced

### Shield and seal

**No code** No shield and seal  
**TT<sup>2)</sup>** Sealed  
**PP<sup>2)</sup>** Shielded

### Material and surface treatment of inner ring

|                | Material | Surface treatment                                                       |
|----------------|----------|-------------------------------------------------------------------------|
| <b>No code</b> | 440C     | –                                                                       |
| <b>CP6</b>     | 440C     | Chromium plated sphere                                                  |
| <b>CP109</b>   | 440C     | XCR plating on sphere (chromium 6 free replacement to chromium plating) |
| <b>CP55</b>    | 440C     | Passivated inner ring                                                   |
| <b>CP33</b>    | PH13.8   | –                                                                       |
| <b>CP194</b>   | PH13.8   | Chromium plated sphere                                                  |
| <b>CP195</b>   | PH13.8   | XCR plating on sphere (chromium 6 free replacement to chromium plating) |
| <b>CP196</b>   | PH13.8   | Passivated inner ring                                                   |

### Oversize

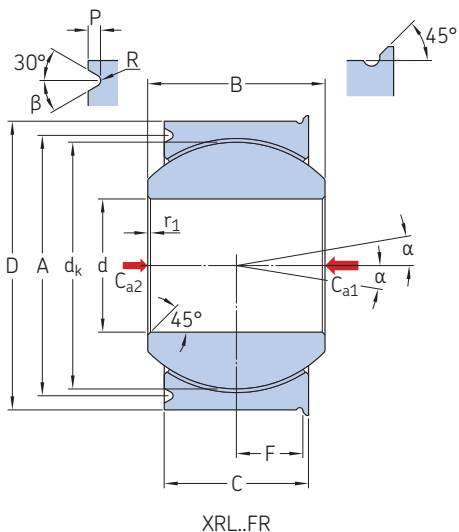
**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> Only available for  $d \geq 6$

<sup>2)</sup> Only available for  $d \geq 7,94$

## 2.34 Self-lubricating pre-staked (inch dimensions)

XRL..FR bore code 6,35 to 12,7



|                                |                                          |
|--------------------------------|------------------------------------------|
| <b>Technical specification</b> | –                                        |
| <b>Product standards</b>       | –                                        |
| <b>Materials</b>               |                                          |
| Liner                          | X1                                       |
| Inner ring                     | Corrosion-resistant steel 440C or PH13.8 |
| Outer ring                     | Corrosion-resistant steel 17-4PH         |

| d                   | β  |
|---------------------|----|
| in/mm               | °  |
| 0.2500<br>6,35      | 20 |
| ≥ 0.3125<br>≥ 7,938 | 30 |

### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d<br>Bore with-out liner<br>0/-0.0005<br>0/-0,0127 | d <sub>a</sub><br>= d with lined bore<br>+0.0010/0<br>+0,0250/0 | D<br>0/-0.0005<br>0/-0,0127 | C<br>±0.005<br>±0,127 | B<br>0/-0.002<br>0/-0,051 | d <sub>k</sub><br>≈ | r <sub>1</sub><br>± 0.005<br>± 0,127 | A<br>0/-0.010<br>0/-0,254 | P<br>0/-0.010<br>0/-0,254 | R<br>+0.007/0<br>+0,178/0 |
|-------------------|------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------|-----------------------|---------------------------|---------------------|--------------------------------------|---------------------------|---------------------------|---------------------------|
| –                 |                                    | in/mm                                                         |                                                                 |                             |                       |                           |                     |                                      |                           |                           |                           |
| 6,35              | 4                                  | 0.2500<br>6,350                                               | 0.2500<br>6,350                                                 | 0.6250<br>15,875            | 0.327<br>8,306        | 0.437<br>11,100           | 0.391<br>9,919      | 0.010<br>0,254                       | 0.563<br>14,300           | 0.025<br>0,635            | 0.005<br>0,127            |
| 7,94              | 5                                  | 0.3125<br>7,938                                               | 0.3125<br>7,938                                                 | 0.6875<br>17,462            | 0.317<br>8,052        | 0.437<br>11,100           | 0.477<br>12,109     | 0.010<br>0,254                       | 0.625<br>15,875           | 0.025<br>0,635            | 0.005<br>0,127            |
| 9,52              | 6                                  | 0.3750<br>9,525                                               | 0.3750<br>9,525                                                 | 0.8125<br>20,638            | 0.406<br>10,312       | 0.500<br>12,700           | 0.598<br>15,193     | 0.010<br>0,254                       | 0.712<br>18,085           | 0.035<br>0,889            | 0.010<br>0,254            |
| 11,11             | 7                                  | 0.4375<br>11,113                                              | 0.4375<br>11,113                                                | 0.9375<br>23,812            | 0.442<br>11,227       | 0.562<br>14,275           | 0.693<br>17,594     | 0.010<br>0,254                       | 0.837<br>21,260           | 0.035<br>0,889            | 0.010<br>0,254            |
| 12,7              | 8                                  | 0.5000<br>12,700                                              | 0.5000<br>12,700                                                | 1.0000<br>25,400            | 0.505<br>12,827       | 0.625<br>15,875           | 0.786<br>19,975     | 0.010<br>0,254                       | 0.900<br>22,860           | 0.035<br>0,889            | 0.010<br>0,254            |

### Dimensions, loads and torque

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions F<br>+0.004/0<br>+0,102/0 | α <sup>1)</sup> | Mass ≈      | Static limit loads    |                 | Radial C <sub>s</sub> | Radial dynamic load C <sub>25</sub> | Starting torque <sup>1)</sup> |             |
|-------------------|------------------------------------|--------------------------------------|-----------------|-------------|-----------------------|-----------------|-----------------------|-------------------------------------|-------------------------------|-------------|
|                   |                                    |                                      |                 |             | Axial C <sub>a1</sub> | C <sub>a2</sub> |                       |                                     | Standard                      | Reduced max |
| –                 |                                    | in/mm                                | °               | lb/g        | lbf/kN                |                 |                       |                                     | lbf-in/Nm                     |             |
| 6,35              | 4                                  | 0.146<br>3,71                        | 15              | 0.03<br>14  | 1 770<br>7,87         | 900<br>4,00     | 5 500<br>24,47        | 4 900<br>21,80                      | 1/5<br>0,11/0,56              | 0,5<br>0,06 |
| 7,94              | 5                                  | 0.142<br>3,61                        | 14              | 0.035<br>16 | 1 640<br>7,30         | 1 115<br>4,96   | 9 400<br>41,81        | 6 050<br>26,91                      | 1/5<br>0,11/0,56              | 1<br>0,11   |
| 9,52              | 6                                  | 0.177<br>4,50                        | 8               | 0.06<br>27  | 2 630<br>11,70        | 2 318<br>10,31  | 13 700<br>60,94       | 8 310<br>36,96                      | 1/5<br>0,11/0,56              | 1<br>0,11   |
| 11,11             | 7                                  | 0.195<br>4,95                        | 10              | 0.08<br>38  | 3 650<br>16,24        | 2 893<br>12,87  | 20 700<br>92,08       | 11 750<br>52,27                     | 1/5<br>0,11/0,56              | 1<br>0,11   |
| 12,7              | 8                                  | 0.226<br>5,74                        | 9               | 0.1<br>45   | 4 970<br>22,11        | 4 000<br>17,79  | 21 400<br>95,19       | 14 950<br>66,50                     | 1/5<br>0,11/0,56              | 1<br>0,11   |

<sup>1)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149



## Designation system

Examples: ZXRL19,05FRAXTTCP33RP01  
XRL 9,52FRPPCP109

Z XRL 19,05 FR A X TT CP33 RP01

### Surface treatment of outer ring

**No code** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

### Basic designation

#### Bore code

#### Lined bore

**No code** Bore without liner  
**A<sup>1)</sup>** Lined bore

#### Starting torque

**No code** Standard  
**X** Reduced

#### Shield and seal

**No code** No shield and seal  
**TT<sup>1)</sup>** Sealed  
**PP<sup>1)</sup>** Shielded

### Material and surface treatment of inner ring

|                | Material | Surface treatment                                                       |
|----------------|----------|-------------------------------------------------------------------------|
| <b>No code</b> | 440C     | Not plated                                                              |
| <b>CP6</b>     | 440C     | Chromium plated sphere                                                  |
| <b>CP109</b>   | 440C     | XCR plating on sphere (chromium 6 free replacement to chromium plating) |
| <b>CP55</b>    | 440C     | Passivated inner ring                                                   |
| <b>CP33</b>    | PH13.8   | Not plated                                                              |
| <b>CP194</b>   | PH13.8   | Chromium plated sphere                                                  |
| <b>CP195</b>   | PH13.8   | XCR plating on sphere (chromium 6 free replacement to chromium plating) |
| <b>CP196</b>   | PH13.8   | Passivated inner ring                                                   |

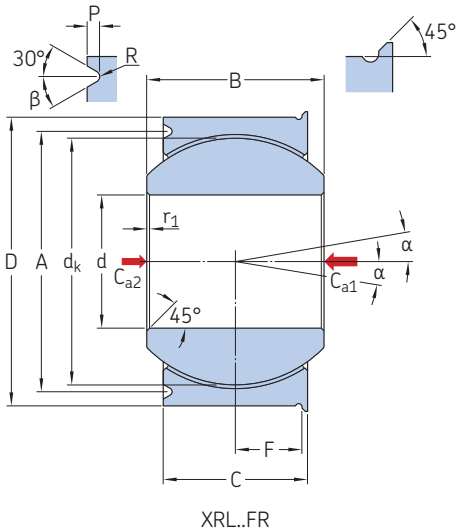
#### Oversize

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> Only available for  $d \geq 7,94$

## 2.34 Self-lubricating pre-staked (inch dimensions)

XRL..FR bore code **14,29** to **25,4**



XRL..FR

|                                |                                          |
|--------------------------------|------------------------------------------|
| <b>Technical specification</b> | –                                        |
| <b>Product standards</b>       | –                                        |
| <b>Materials</b>               |                                          |
| Liner                          | X1                                       |
| Inner ring                     | Corrosion-resistant steel 440C or PH13.8 |
| Outer ring                     | Corrosion-resistant steel 17-4PH         |

| d                   | β  |
|---------------------|----|
| in/mm               | °  |
| 0.2500<br>6,35      | 20 |
| ≥ 0.3125<br>≥ 7,938 | 30 |

### Dimensions

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d<br>Bore with-<br>out liner<br>0/-0.0005<br>0/-0,0127 | d <sub>a</sub><br>= d with<br>lined bore<br>+0.0010/0<br>+0,0250/0 | D<br>0/-0.0005<br>0/-0,0127 | C<br>±0.005<br>±0,127 | B<br>0/-0.002<br>0/-0,051 | d <sub>k</sub><br>≈ | r <sub>1</sub><br>± 0.005<br>± 0,127 | A<br>0/-0.010<br>0/-0,254 | P<br>0/-0.010<br>0/-0,254 | R<br>+0.007/0<br>+0,178/0 |
|-------------------|------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------|-----------------------|---------------------------|---------------------|--------------------------------------|---------------------------|---------------------------|---------------------------|
| –                 |                                          | in/mm                                                                |                                                                    |                             |                       |                           |                     |                                      |                           |                           |                           |
| <b>14,29</b>      | <b>9</b>                                 | 0.5625<br>14,288                                                     | 0.5625<br>14,288                                                   | 1.1250<br>28,575            | 0.536<br>13,614       | 0.687<br>17,450           | 0.914<br>23,227     | 0.010<br>0,254                       | 1.025<br>26,035           | 0.035<br>0,889            | 0.010<br>0,254            |
| <b>15,87</b>      | <b>10</b>                                | 0.6250<br>15,875                                                     | 0.6250<br>15,875                                                   | 1.1875<br>30,163            | 0.567<br>14,400       | 0.750<br>19,050           | 0.974<br>24,739     | 0.010<br>0,254                       | 1.087<br>27,610           | 0.035<br>0,889            | 0.010<br>0,254            |
| <b>19,05</b>      | <b>12</b>                                | 0.7500<br>19,050                                                     | 0.7500<br>19,050                                                   | 1.3750<br>34,925            | 0.630<br>16,002       | 0.875<br>22,225           | 1.130<br>28,702     | 0.010<br>0,254                       | 1.251<br>31,775           | 0.055<br>1,397            | 0.010<br>0,254            |
| <b>22,22</b>      | <b>14</b>                                | 0.8750<br>22,225                                                     | 0.8750<br>22,225                                                   | 1.6250<br>41,275            | 0.755<br>19,177       | 0.875<br>22,225           | 1.325<br>33,655     | 0.010<br>0,254                       | 1.501<br>38,125           | 0.055<br>1,397            | 0.010<br>0,254            |
| <b>25,4</b>       | <b>16</b>                                | 1.0000<br>25,400                                                     | 1.0000<br>25,400                                                   | 2.1250<br>53,975            | 1.005<br>25,527       | 1.375<br>34,925           | 1.616<br>41,038     | 0.010<br>0,254                       | 2.001<br>50,825           | 0.055<br>1,397            | 0.010<br>0,254            |

### Dimensions, loads and torque

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>F<br>+0.004/0<br>+0,102/0 | α <sup>1)</sup> | Mass<br>≈   | Static limit loads       |                 | Radial<br>C <sub>s</sub> | Radial dynamic<br>load<br>C <sub>25</sub> | Starting torque <sup>1)</sup> |                |
|-------------------|------------------------------------------|-----------------------------------------|-----------------|-------------|--------------------------|-----------------|--------------------------|-------------------------------------------|-------------------------------|----------------|
| –                 |                                          | in/mm                                   | °               | lb/g        | Axial<br>C <sub>a1</sub> | C <sub>a2</sub> |                          |                                           | Standard                      | Reduced<br>max |
| –                 |                                          | lbf-in/Nm                               |                 |             |                          |                 |                          |                                           |                               |                |
| <b>14,29</b>      | <b>9</b>                                 | 0.242<br>6,15                           | 10              | 0.14<br>61  | 5 370<br>23,89           | 4 678<br>20,81  | 26 600<br>118,32         | 18 100<br>80,51                           | 1/5<br>0,11/0,56              | 1<br>0,11      |
| <b>15,87</b>      | <b>10</b>                                | 0.258<br>6,55                           | 12              | 0.16<br>73  | 6 130<br>27,27           | 6 130<br>27,27  | 29 000<br>129,00         | 20 250<br>90,08                           | 1/5<br>0,11/0,56              | 1<br>0,11      |
| <b>19,05</b>      | <b>12</b>                                | 0.27<br>6,86                            | 13              | 0.24<br>109 | 7 730<br>34,38           | 6 700<br>29,80  | 37 000<br>164,58         | 26 200<br>116,54                          | 1/5<br>0,11/0,56              | 1<br>0,11      |
| <b>22,22</b>      | <b>14</b>                                | 0.333<br>8,46                           | 6               | 0.35<br>159 | 10 800<br>48,04          | 8 150<br>36,25  | 65 200<br>290,02         | 33 600<br>149,46                          | 2/8<br>0,23/0,9               | 2<br>0,23      |
| <b>25,4</b>       | <b>16</b>                                | 0.457<br>11,61                          | 12              | 0.97<br>440 | 19 300<br>85,85          | 11 198<br>49,81 | 104 000<br>462,62        | 56 250<br>250,21                          | 2/8<br>0,23/0,9               | 2<br>0,23      |

<sup>1)</sup> Values are given for non protected bearings. For sealed and shielded bearings, refer to page 149





## Designation system

Examples: ZXRL19,05FRAXTTCP33RP01  
XRL 9,52FRPPCP109

Z XRL 19,05 FR A X TT CP33 RP01

### Surface treatment of outer ring

**No code** Not plated  
**Z** Cadmium plated external dimensions  
**SZ** Zinc-nickel plated external dimensions

### Basic designation

#### Bore code

#### Lined bore

**No code** Bore without liner  
**A<sup>1)</sup>** Lined bore

#### Starting torque

**No code** Standard  
**X** Reduced

#### Shield and seal

**No code** No shield and seal  
**TT<sup>1)</sup>** Sealed  
**PP<sup>1)</sup>** Shielded

### Material and surface treatment of inner ring

|                | Material | Surface treatment                                                       |
|----------------|----------|-------------------------------------------------------------------------|
| <b>No code</b> | 440C     | Not plated                                                              |
| <b>CP6</b>     | 440C     | Chromium plated sphere                                                  |
| <b>CP109</b>   | 440C     | XCR plating on sphere (chromium 6 free replacement to chromium plating) |
| <b>CP55</b>    | 440C     | Passivated inner ring                                                   |
| <b>CP33</b>    | PH13.8   | Not plated                                                              |
| <b>CP194</b>   | PH13.8   | Chromium plated sphere                                                  |
| <b>CP195</b>   | PH13.8   | XCR plating on sphere (chromium 6 free replacement to chromium plating) |
| <b>CP196</b>   | PH13.8   | Passivated inner ring                                                   |

#### Oversize

**No code** Standard outer diameter size  
**RP01** 0.010 in/0,254 mm oversized outer diameter  
**RP02** 0.020 in/0,508 mm oversized outer diameter

<sup>1)</sup> Only available for  $d \geq 7,94$

## Cross-reference

## Metal-to-metal spherical plain bearings

## Metric bearings

2

| EN part number | SKF designation              | EN part number                                                                                                                                                   | SKF designation             |
|----------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| EN2335BPd'FR   | WMASdRX-2 <sup>2)</sup>      | EN2335APd'FRT                                                                                                                                                    | WMASdRXC55 <sup>2)</sup>    |
| EN2335BPd'FR1  | WMASdPRX-2 <sup>2)</sup>     | EN2335APd'FRT1                                                                                                                                                   | WMASdPRXC55 <sup>2)</sup>   |
| EN2335BPd'GR   | WMACdRX-2 <sup>2)</sup>      | EN2335APd'GRT                                                                                                                                                    | WMACdRXC55 <sup>2)</sup>    |
| EN2335BPd'GR1  | WMACdPRX-2 <sup>2)</sup>     | EN2335APd'GRT1                                                                                                                                                   | WMACdPRXC55 <sup>2)</sup>   |
| EN2335BPd'ER   | WMAAdRX-2 <sup>1)</sup>      | EN2335APd'ERT                                                                                                                                                    | WMAAdRXC55 <sup>1)</sup>    |
| EN2335BPd'ER1  | WMAAdPRX-2 <sup>1)</sup>     | EN2335APd'ERT1                                                                                                                                                   | WMAAdPRXC55 <sup>1)</sup>   |
| EN2335APd'FR   | WMASdRX <sup>2)</sup>        | EN2335BPd'FST                                                                                                                                                    | WMASdX-2CP55 <sup>2)</sup>  |
| EN2335APd'FR1  | WMASdPRX <sup>2)</sup>       | EN2335BPd'GST                                                                                                                                                    | WMACdX-2CP55 <sup>2)</sup>  |
| EN2335APd'GR   | WMACdRX <sup>2)</sup>        | EN2335BPd'EST                                                                                                                                                    | WMAAdX-2CP55                |
| EN2335APd'GR1  | WMACdPRX <sup>2)</sup>       | EN2335APd'FST                                                                                                                                                    | WMASdXCP55 <sup>2)</sup>    |
| EN2335APd'ER   | WMAAdRX <sup>1)</sup>        | EN2335APd'GST                                                                                                                                                    | WMACdXCP55 <sup>2)</sup>    |
| EN2335APd'ER1  | WMAAdPRX <sup>1)</sup>       | EN2335APd'EST                                                                                                                                                    | WMAAdXCP55                  |
| EN2335BPd'FS   | WMASdX-2 <sup>2)</sup>       | EN2335BNd'FRT                                                                                                                                                    | WMASdR-2CP55 <sup>2)</sup>  |
| EN2335BPd'GS   | WMACdX-2 <sup>2)</sup>       | EN2335BNd'FRT1                                                                                                                                                   | WMASdPR-2CP55 <sup>2)</sup> |
| EN2335BPd'ES   | WMAAdX-2                     | EN2335BNd'GRT                                                                                                                                                    | WMACdR-2CP55 <sup>2)</sup>  |
| EN2335APd'FS   | WMASdX <sup>2)</sup>         | EN2335BNd'GRT1                                                                                                                                                   | WMACdPR-2CP55 <sup>2)</sup> |
| EN2335APd'GS   | WMACdX <sup>2)</sup>         | EN2335BNd'ERT                                                                                                                                                    | WMAAdR-2CP55 <sup>1)</sup>  |
| EN2335APd'ES   | WMAAdX                       | EN2335BNd'ERT1                                                                                                                                                   | WMAAdPR-2CP55 <sup>1)</sup> |
| EN2335BNd'FR   | WMASdR-2 <sup>2)</sup>       | EN2335ANd'FRT                                                                                                                                                    | WMASdRCP55 <sup>2)</sup>    |
| EN2335BNd'FR1  | WMASdPR-2 <sup>2)</sup>      | EN2335ANd'FRT1                                                                                                                                                   | WMASdPRCP55 <sup>2)</sup>   |
| EN2335BNd'GR   | WMACdR-2 <sup>2)</sup>       | EN2335ANd'GRT                                                                                                                                                    | WMACdRCP55 <sup>2)</sup>    |
| EN2335BNd'GR1  | WMACdPR-2 <sup>2)</sup>      | EN2335ANd'GRT1                                                                                                                                                   | WMACdPRCP55 <sup>2)</sup>   |
| EN2335BNd'ER   | WMAAdR-2 <sup>1)</sup>       | EN2335ANd'ERT                                                                                                                                                    | WMAAdRCP55 <sup>1)</sup>    |
| EN2335BNd'ER1  | WMAAdPR-2 <sup>1)</sup>      | EN2335ANd'ERT1                                                                                                                                                   | WMAAdPRCP55 <sup>1)</sup>   |
| EN2335ANd'FR   | WMASdR <sup>2)</sup>         | EN2335BNd'FST                                                                                                                                                    | WMASd-2CP55 <sup>2)</sup>   |
| EN2335ANd'FR1  | WMASdPR <sup>2)</sup>        | EN2335BNd'GST                                                                                                                                                    | WMACd-2CP55 <sup>2)</sup>   |
| EN2335ANd'GR   | WMACdR <sup>2)</sup>         | EN2335BNd'EST                                                                                                                                                    | WMAAd-2CP55                 |
| EN2335ANd'GR1  | WMACdPR <sup>2)</sup>        | EN2335ANd'FST                                                                                                                                                    | WMASdCP55 <sup>2)</sup>     |
| EN2335ANd'ER   | WMAAdR <sup>1)</sup>         | EN2335ANd'GST                                                                                                                                                    | WMACdCP55 <sup>2)</sup>     |
| EN2335ANd'ER1  | WMAAdPR <sup>1)</sup>        | EN2335ANd'EST                                                                                                                                                    | WMAAdCP55                   |
| EN2335BNd'FS   | WMASd-2 <sup>2)</sup>        | Where<br><b>d</b> = Bore code, with $d \leq 60$<br><b>d'</b> = with a 0 replacing the space for $d \leq 8$<br>d for $d \geq 10$                                  |                             |
| EN2335BNd'GS   | WMACd-2 <sup>2)</sup>        |                                                                                                                                                                  |                             |
| EN2335BNd'ES   | WMAAd-2                      |                                                                                                                                                                  |                             |
| EN2335ANd'FS   | WMASd <sup>2)</sup>          | <sup>1)</sup> Except for $d \leq 10$ <sup>2)</sup> Except for $d \leq 12$                                                                                        |                             |
| EN2335ANd'GS   | WMACd <sup>2)</sup>          |                                                                                                                                                                  |                             |
| EN2335ANd'ES   | WMAAd                        | <b>Example</b><br>EN part number                      SKF designation<br>EN2335BP20FR                      WMAS20RX-2<br>EN2335AN06ES                      WMA 6 |                             |
| EN2335BPd'FRT  | WMASdRX-2CP55 <sup>2)</sup>  |                                                                                                                                                                  |                             |
| EN2335BPd'FRT1 | WMASdPRX-2CP55 <sup>2)</sup> |                                                                                                                                                                  |                             |
| EN2335BPd'GRT  | WMACdRX-2CP55 <sup>2)</sup>  |                                                                                                                                                                  |                             |
| EN2335BPd'GRT1 | WMACdPRX-2CP55 <sup>2)</sup> |                                                                                                                                                                  |                             |
| EN2335BPd'ERT  | WMAAdRX-2CP55 <sup>1)</sup>  |                                                                                                                                                                  |                             |
| EN2335BPd'ERT1 | WMAAdPRX-2CP55 <sup>1)</sup> |                                                                                                                                                                  |                             |

| EN part number | SKF designation     |
|----------------|---------------------|
| EN2336APd'E    | GE $d$ -C3A         |
| EN2336APd'F    | GES $d$ -C3A        |
| EN2336APd'G    | GEC $d$ -C3A        |
| EN2336ANd'E    | GE $d$ D-C2A        |
| EN2336ANd'F    | GES $d$ D-C2A       |
| EN2336ANd'G    | GEC $d$ D-C2A       |
| EN2336BPd'E    | GE $d$ -C3A-2       |
| EN2336BPd'F    | GES $d$ -C3A-2      |
| EN2336BPd'G    | GEC $d$ -C3A-2      |
| EN2336BNd'E    | GE $d$ D-C2A-2      |
| EN2336BNd'F    | GES $d$ D-C2A-2     |
| EN2336BNd'G    | GEC $d$ D-C2A-2     |
| EN2588APd'E    | WGE $d$ -C3A        |
| EN2588APd'F    | WGES $d$ -C3A       |
| EN2588APd'G    | WGE $d$ -C3A        |
| EN2588ANd'E    | WGE $d$ D-C2A       |
| EN2588ANd'F    | WGES $d$ D-C2A      |
| EN2588ANd'G    | WGE $d$ D-C2A       |
| EN2588BPd'E    | WGE $d$ -C3A-2      |
| EN2588BPd'F    | WGES $d$ -C3A-2     |
| EN2588BPd'G    | WGE $d$ -C3A-2      |
| EN2588BNd'E    | WGE $d$ D-C2A-2     |
| EN2588BNd'F    | WGES $d$ D-C2A-2    |
| EN2588BNd'G    | WGE $d$ D-C2A-2     |
| EN2588APd'ET   | WGE $d$ -C3ACP55    |
| EN2588APd'FT   | WGES $d$ -C3ACP55   |
| EN2588APd'GT   | WGE $d$ -C3ACP55    |
| EN2588ANd'ET   | WGE $d$ D-C2ACP55   |
| EN2588ANd'FT   | WGES $d$ D-C2ACP55  |
| EN2588ANd'GT   | WGE $d$ D-C2ACP55   |
| EN2588BPd'ET   | WGE $d$ -C3A-2CP55  |
| EN2588BPd'FT   | WGES $d$ -C3A-2CP55 |
| EN2588BPd'GT   | WGE $d$ -C3A-2CP55  |

| EN part number | SKF designation      |
|----------------|----------------------|
| EN2588BNd'ET   | WGE $d$ D-C2A-2CP55  |
| EN2588BNd'FT   | WGES $d$ D-C2A-2CP55 |
| EN2588BNd'GT   | WGE $d$ D-C2A-2CP55  |

Where

$d$  = Bore code, with  $d \geq 5$

$d'$  =  $d$  with a 0 replacing the space for  $d \leq 8$   
 $d$  for  $d \geq 10$

**Example**

| EN part number | SKF designation   |
|----------------|-------------------|
| EN2336AP05G    | GEC 5-C3A         |
| EN2588BN40FT   | WGES40D-C2A-2CP55 |

## Inch bearings

2

| EN part number | SKF designation         |
|----------------|-------------------------|
| EN6046BNd'ERZ  | ZENE <sup>d</sup> R-2   |
| EN6046BNd'FRZ  | ZENES <sup>d</sup> R-2  |
| EN6046BNd'GRZ  | ZENEC <sup>d</sup> R-2  |
| EN6046BPd'ERZ  | ZENE <sup>d</sup> RX-2  |
| EN6046BPd'FRZ  | ZENES <sup>d</sup> RX-2 |
| EN6046BPd'GRZ  | ZENEC <sup>d</sup> RX-2 |
| EN6046ANd'ERZ  | ZENE <sup>d</sup> R     |
| EN6046ANd'FRZ  | ZENES <sup>d</sup> R    |
| EN6046ANd'GRZ  | ZENEC <sup>d</sup> R    |
| EN6046APd'ERZ  | ZENE <sup>d</sup> RX    |
| EN6046APd'FRZ  | ZENES <sup>d</sup> RX   |
| EN6046APd'GRZ  | ZENEC <sup>d</sup> RX   |
| EN6046BNd'ESZ  | ZENE <sup>d</sup> -2    |
| EN6046BNd'FSZ  | ZENES <sup>d</sup> -2   |
| EN6046BNd'GSZ  | ZENEC <sup>d</sup> -2   |
| EN6046BPd'ESZ  | ZENE <sup>d</sup> X-2   |
| EN6046BPd'FSZ  | ZENES <sup>d</sup> X-2  |
| EN6046BPd'GSZ  | ZENEC <sup>d</sup> X-2  |
| EN6046ANd'ESZ  | ZENE <sup>d</sup>       |
| EN6046ANd'FSZ  | ZENES <sup>d</sup>      |
| EN6046ANd'GSZ  | ZENEC <sup>d</sup>      |
| EN6046APd'ESZ  | ZENE <sup>d</sup> X     |
| EN6046APd'FSZ  | ZENES <sup>d</sup> X    |
| EN6046APd'GSZ  | ZENEC <sup>d</sup> X    |
| EN6046BNd'ER   | ENE <sup>d</sup> R-2    |
| EN6046BNd'FR   | ENES <sup>d</sup> R-2   |
| EN6046BNd'GR   | ENEC <sup>d</sup> R-2   |
| EN6046BPd'ER   | ENE <sup>d</sup> RX-2   |
| EN6046BPd'FR   | ENES <sup>d</sup> RX-2  |
| EN6046BPd'GR   | ENEC <sup>d</sup> RX-2  |
| EN6046ANd'ER   | ENE <sup>d</sup> R      |
| EN6046ANd'FR   | ENES <sup>d</sup> R     |
| EN6046ANd'GR   | ENEC <sup>d</sup> R     |
| EN6046APd'ER   | ENE <sup>d</sup> RX     |
| EN6046APd'FR   | ENES <sup>d</sup> RX    |
| EN6046APd'GR   | ENEC <sup>d</sup> RX    |
| EN6046BNd'ES   | ENE <sup>d</sup> -2     |
| EN6046BNd'FS   | ENES <sup>d</sup> -2    |
| EN6046BNd'GS   | ENEC <sup>d</sup> -2    |

| EN part number                                       | SKF designation       |
|------------------------------------------------------|-----------------------|
| EN6046BPd'ES                                         | ENE <sup>d</sup> X-2  |
| EN6046BPd'FS                                         | ENES <sup>d</sup> X-2 |
| EN6046BPd'GS                                         | ENEC <sup>d</sup> X-2 |
| EN6046ANd'ES                                         | ENE <sup>d</sup>      |
| EN6046ANd'FS                                         | ENES <sup>d</sup>     |
| EN6046ANd'GS                                         | ENEC <sup>d</sup>     |
| EN6046APd'ES                                         | ENE <sup>d</sup> X    |
| EN6046APd'FS                                         | ENES <sup>d</sup> X   |
| EN6046APd'GS                                         | ENEC <sup>d</sup> X   |
| Where                                                |                       |
| <sup>d</sup> = Bore code                             |                       |
| <sup>d'</sup> = dash number (multiples of 1/16 inch) |                       |
| <b>Example</b>                                       |                       |
| EN part number                                       | SKF designation       |
| EN6046BN06FRZ                                        | ZENES <b>9,52</b> R-2 |
| EN6046BP14GS                                         | ENEC <b>22,22</b> X-2 |

| EN part number | SKF designation        |
|----------------|------------------------|
| EN4265BPd'ER   | ENL <sup>d</sup> RX-2  |
| EN4265BPd'FR   | ENLS <sup>d</sup> RX-2 |
| EN4265BPd'GR   | ENLC <sup>d</sup> RX-2 |
| EN4265APd'ER   | ENL <sup>d</sup> RX    |
| EN4265APd'FR   | ENLS <sup>d</sup> RX   |
| EN4265APd'GR   | ENLC <sup>d</sup> RX   |
| EN4265BNd'ER   | ENL <sup>d</sup> R-2   |
| EN4265NPd'FR   | ENLS <sup>d</sup> R-2  |
| EN4265NPd'GR   | ENLC <sup>d</sup> R-2  |
| EN4265ANd'ER   | ENL <sup>d</sup> R     |
| EN4265ANd'FR   | ENLS <sup>d</sup> R    |
| EN4265ANd'GR   | ENLC <sup>d</sup> R    |
| EN4265BPd'ES   | ENL <sup>d</sup> X-2   |
| EN4265BPd'FS   | ENLS <sup>d</sup> X-2  |
| EN4265BPd'GS   | ENLC <sup>d</sup> X-2  |
| EN4265APd'ES   | ENL <sup>d</sup> X     |
| EN4265APd'FS   | ENLS <sup>d</sup> X    |
| EN4265APd'GS   | ENLC <sup>d</sup> X    |

| EN part number        | SKF designation     |
|-----------------------|---------------------|
| EN4265BN <b>d</b> 'ES | ENL <b>d</b> -2     |
| EN4265NP <b>d</b> 'FS | ENLS <b>d</b> -2    |
| EN4265NP <b>d</b> 'GS | ENLC <b>d</b> -2    |
| EN4265AN <b>d</b> 'ES | ENL <b>d</b>        |
| EN4265AN <b>d</b> 'FS | ENLS <b>d</b>       |
| EN4265AN <b>d</b> 'GS | ENLC <b>d</b>       |
| EN4266BP <b>d</b> 'ER | ZENL <b>d</b> RX-2  |
| EN4266BP <b>d</b> 'FR | ZENLS <b>d</b> RX-2 |
| EN4266BP <b>d</b> 'GR | ZENLC <b>d</b> RX-2 |
| EN4266AP <b>d</b> 'ER | ZENL <b>d</b> RX    |
| EN4266AP <b>d</b> 'FR | ZENLS <b>d</b> RX   |
| EN4266AP <b>d</b> 'GR | ZENLC <b>d</b> RX   |
| EN4266BN <b>d</b> 'ER | ZENL <b>d</b> R-2   |
| EN4266NP <b>d</b> 'FR | ZENLS <b>d</b> R-2  |
| EN4266NP <b>d</b> 'GR | ZENLC <b>d</b> R-2  |
| EN4266AN <b>d</b> 'ER | ZENL <b>d</b> R     |
| EN4266AN <b>d</b> 'FR | ZENLS <b>d</b> R    |
| EN4266AN <b>d</b> 'GR | ZENLC <b>d</b> R    |
| EN4266BP <b>d</b> 'ES | ZENL <b>d</b> X-2   |
| EN4266BP <b>d</b> 'FS | ZENLS <b>d</b> X-2  |
| EN4266BP <b>d</b> 'GS | ZENLC <b>d</b> X-2  |
| EN4266AP <b>d</b> 'ES | ZENL <b>d</b> X     |
| EN4266AP <b>d</b> 'FS | ZENLS <b>d</b> X    |
| EN4266AP <b>d</b> 'GS | ZENLC <b>d</b> X    |
| EN4266BN <b>d</b> 'ES | ZENL <b>d</b> -2    |
| EN4266NP <b>d</b> 'FS | ZENLS <b>d</b> -2   |
| EN4266NP <b>d</b> 'GS | ZENLC <b>d</b> -2   |
| EN4266AN <b>d</b> 'ES | ZENL <b>d</b>       |
| EN4266AN <b>d</b> 'FS | ZENLS <b>d</b>      |
| EN4266AN <b>d</b> 'GS | ZENLC <b>d</b>      |

Where  
**d** = Bore code  
**d'** = dash number (multiples of 1/16 inch)

**Example**

| EN part number        | SKF designation        |
|-----------------------|------------------------|
| EN4265BP <b>07</b> FR | ENLS <b>11,11</b> RX-2 |
| EN4266AN <b>12</b> GS | ZENLC <b>19,05</b>     |

| AS part number         | SKF designation      |
|------------------------|----------------------|
| M81936/1- <b>d</b> 'RT | QXMBC <b>d</b> RRP01 |
| M81936/1- <b>d</b> 'RU | QXMBC <b>d</b> RRP02 |
| M81936/1- <b>d</b> 'R  | QXMBC <b>d</b> R     |
| M81936/1- <b>d</b> 'T  | QXMBY <b>d</b> RRP01 |
| M81936/1- <b>d</b> 'U  | QXMBY <b>d</b> RRP02 |
| M81936/1- <b>d</b> '   | QXMBY <b>d</b> R     |
| M81936/2- <b>d</b> 'RT | QXMBC <b>d</b> RP01  |
| M81936/2- <b>d</b> 'RU | QXMBC <b>d</b> RP02  |
| M81936/2- <b>d</b> 'R  | QXMBC <b>d</b>       |
| M81936/2- <b>d</b> 'T  | QXMBY <b>d</b> RP01  |
| M81936/2- <b>d</b> 'U  | QXMBY <b>d</b> RP02  |
| M81936/2- <b>d</b> '   | QXMBY <b>d</b>       |

Where  
**d** = Bore code  
**d'** = dash number (multiples of 1/16 inch)

**Example**

| AS part number        | SKF designation         |
|-----------------------|-------------------------|
| M81936/1- <b>4</b> RT | QXMBC <b>6,35</b> RRP01 |
| M81936/2- <b>12</b>   | QXMBY <b>19,05</b>      |

| AS part number       | SKF designation         |
|----------------------|-------------------------|
| MS21154 <b>S</b> d'E | SZWMEY <b>d</b> R-4CP6  |
| MS21154 <b>S</b> d'  | ZWMEY <b>d</b> R-4CP6   |
| MS21154 <b>B</b> d'E | SZWQMEY <b>d</b> R-4CP6 |
| MS21154 <b>B</b> d'  | ZWQMEY <b>d</b> R-4CP6  |
| MS21155 <b>S</b> d'E | SZWMEY <b>d</b> -4CP6   |
| MS21155 <b>S</b> d'  | ZWMEY <b>d</b> -4CP6    |
| MS21155 <b>B</b> d'E | SZWQMEY <b>d</b> -4CP6  |
| MS21155 <b>B</b> d'  | ZWQMEY <b>d</b> -4CP6   |

Where  
**d** = Bore code, with d ≤ 25,4  
**d'** = dash number (multiples of 1/16 inch)

**Example**

| AS part number               | SKF designation           |
|------------------------------|---------------------------|
| MS21154 <b>S</b> <b>03</b> E | SZWMEY <b>4,83</b> R-4CP6 |
| MS21155 <b>B</b> <b>14</b>   | ZWQMEY <b>22,22</b> -4CP6 |

## Self-lubricating spherical plain bearings

## Metric bearings

2

| EN part number                    | SKF designation  |
|-----------------------------------|------------------|
| EN3048S <b>d</b> PA <sup>1)</sup> | LEN <b>d</b> F   |
| EN3048S <b>d</b> TA <sup>1)</sup> | LEN <b>d</b> V   |
| EN3048S <b>d</b> A <sup>1)</sup>  | LEN <b>d</b>     |
| EN3048R <b>d</b> PA <sup>1)</sup> | LEN <b>d</b> RF  |
| EN3048R <b>d</b> TA <sup>1)</sup> | LEN <b>d</b> RV  |
| EN3048R <b>d</b> A <sup>1)</sup>  | LEN <b>d</b> R   |
| EN3048R <b>d</b> PA <sup>1)</sup> | LEN <b>d</b> PRF |
| EN3048R <b>d</b> TA <sup>1)</sup> | LEN <b>d</b> PRV |
| EN3048R <b>d</b> A <sup>1)</sup>  | LEN <b>d</b> PR  |
| EN 4037S <b>d</b> T <sup>1)</sup> | LEN <b>d</b> XV  |
| EN 4037S <b>d</b> <sup>1)</sup>   | LEN <b>d</b> X   |
| EN 4037R <b>d</b> T <sup>1)</sup> | LEN <b>d</b> RXV |
| EN 4037R <b>d</b> <sup>1)</sup>   | LEN <b>d</b> RX  |
| EN3048S15PA                       | LEN15/26F        |
| EN3048S15TA                       | LEN15/26V        |
| EN3048S15A                        | LEN15/26         |
| EN3048R15PA                       | LEN15/26RF       |
| EN3048R15TA                       | LEN15/26RV       |
| EN3048R15A                        | LEN15/26R        |
| EN3048R15PA1                      | LEN15/26PRF      |
| EN3048R15TA1                      | LEN15/26PRV      |
| EN3048R15A1                       | LEN15/26PR       |
| EN 4037S15T                       | LEN15/26XV       |
| EN 4037S15                        | LEN15/26X        |
| EN 4037R15T                       | LEN15/26RXV      |
| EN 4037R15                        | LEN15/26RX       |
| EN3048S17PA                       | LEN17/30F        |
| EN3048S17TA                       | LEN17/30V        |
| EN3048S17A                        | LEN17/30         |
| EN3048R17PA                       | LEN17/30RF       |
| EN3048R17TA                       | LEN17/30RV       |
| EN3048R17A                        | LEN17/30R        |
| EN3048R17PA1                      | LEN17/30PRF      |

| EN part number                                  | SKF designation      |
|-------------------------------------------------|----------------------|
| EN3048R17TA1                                    | LEN17/30PRV          |
| EN3048R17A1                                     | LEN17/30PR           |
| EN 4037S17T                                     | LEN17/30XV           |
| EN 4037S17                                      | LEN17/30X            |
| EN 4037R17T                                     | LEN17/30RXV          |
| EN 4037R17                                      | LEN17/30RX           |
| Where<br><b>d</b> = Bore code, with $d \leq 50$ |                      |
| 1) Except for $d = 15$ and $d = 17$ .           |                      |
| <b>Example</b>                                  |                      |
| EN part number                                  | SKF designation      |
| EN3048S <b>12</b> PA                            | LEN <b>12</b> F      |
| EN3048R <b>15</b> TA1                           | LEN <b>15/26</b> PRV |
| EN 4037R <b>35</b>                              | LEN <b>35</b> RX     |

| EN part number                | SKF designation  |
|-------------------------------|------------------|
| EN2584S <b>d</b> PA           | NEN <b>d</b> F   |
| EN2584S <b>d</b> TA           | NEN <b>d</b> V   |
| EN2584S <b>d</b> A            | NEN <b>d</b>     |
| EN2584R <b>d</b> PA           | NEN <b>d</b> RF  |
| EN2584R <b>d</b> TA           | NEN <b>d</b> RV  |
| EN2584R <b>d</b> A            | NEN <b>d</b> R   |
| EN 4038S <b>d</b> T           | NEN <b>d</b> XV  |
| EN 4038S <b>d</b>             | NEN <b>d</b> X   |
| EN 4038R <b>d</b> T           | NEN <b>d</b> RXV |
| EN 4038R <b>d</b>             | NEN <b>d</b> RX  |
| Where<br><b>d</b> = Bore code |                  |
| <b>Example</b>                |                  |
| EN part number                | SKF designation  |
| EN2584S <b>05</b> PA          | NEN <b>05</b> F  |
| EN 4038S <b>12</b>            | NEN <b>12</b> X  |

| EN part number                  | SKF designation                                       |
|---------------------------------|-------------------------------------------------------|
| EN2585S <b>d</b> PA             | WEN <b>d</b> F <sup>1)</sup>                          |
| EN2585S <b>d</b> TA             | WEN <b>d</b> V <sup>1)</sup>                          |
| EN2585S <b>d</b> A              | WEN <b>d</b> <sup>1)</sup>                            |
| EN2585R <b>d</b> PA             | WEN <b>d</b> RF <sup>1)</sup>                         |
| EN2585R <b>d</b> TA             | WEN <b>d</b> RV <sup>1)</sup>                         |
| EN2585R <b>d</b> A              | WEN <b>d</b> R <sup>1)</sup>                          |
| EN 4039S <b>d</b> T             | WEN <b>d</b> XV<br>(For $d \geq 6$ and $d \leq 50$ )  |
| EN 4039S <b>d</b>               | WEN <b>d</b> X<br>(For $d \geq 6$ and $d \leq 50$ )   |
| EN 4039R <b>d</b> T             | WEN <b>d</b> RXV<br>(For $d \geq 6$ and $d \leq 50$ ) |
| EN 4039R <b>d</b>               | WEN <b>d</b> RX<br>(For $d \geq 6$ and $d \leq 50$ )  |
| Where<br><b>d</b> = Bore code   |                                                       |
| <sup>1)</sup> For $d \leq 55$ . |                                                       |
| <b>Example</b>                  |                                                       |
| EN part number                  | SKF designation                                       |
| EN2585S <b>05</b> PA            | WEN <b>05</b> F                                       |
| EN 4039R <b>20</b>              | WEN <b>20</b> RX                                      |

| EN part number                                                                                                             | SKF designation   |
|----------------------------------------------------------------------------------------------------------------------------|-------------------|
| EN4040S <b>d'</b> TN                                                                                                       | HMEN <b>d</b> V   |
| EN4040S <b>d'</b> TL                                                                                                       | HMEN <b>d</b> XV  |
| EN4040S <b>d'</b> N                                                                                                        | HMEN <b>d</b>     |
| EN4040S <b>d'</b> L                                                                                                        | HMEN <b>d</b> X   |
| EN4040R <b>d'</b> TN                                                                                                       | HMEN <b>d</b> RV  |
| EN4040R <b>d'</b> TL                                                                                                       | HMEN <b>d</b> RXV |
| EN4040R <b>d'</b> N                                                                                                        | HMEN <b>d</b> R   |
| EN4040R <b>d'</b> L                                                                                                        | HMEN <b>d</b> RX  |
| Where<br><b>d'</b> = 06 for bore code <b>d</b> = 06B<br>08 for bore code <b>d</b> = 08B<br>10 for bore code <b>d</b> = 10B |                   |
| <b>Example</b>                                                                                                             |                   |
| EN part number                                                                                                             | SKF designation   |
| EN4040S <b>06</b> TN                                                                                                       | HMEN <b>06</b> BV |

## Inch bearings

2

| AS part number           |                             | SKF designation |             |
|--------------------------|-----------------------------|-----------------|-------------|
| MS14101-5ACEKT for d= 5  | MS14101-dCEKT <sup>1)</sup> | SZENASdRXY2     |             |
| MS14101-5ACEKU for d= 5  | MS14101-dCEKU <sup>1)</sup> | SZENASdRXY4     |             |
| MS14101-5ACEK for d= 5   | MS14101-dCEK <sup>1)</sup>  | SZENASdRX       |             |
| MS14101-5ACET for d= 5   | MS14101-dCET <sup>1)</sup>  | SZENASdRY2      |             |
| MS14101-5ACEU for d= 5   | MS14101-dCEU <sup>1)</sup>  | SZENASdRY4      |             |
| MS14101-5ACE for d= 5    | MS14101-dCE <sup>1)</sup>   | SZENASdR        |             |
| MS14101-5ACKT for d= 5   | MS14101-dCKT <sup>1)</sup>  | ENASdRXY2       |             |
| MS14101-5ACKU for d= 5   | MS14101-dCKU <sup>1)</sup>  | ENASdRXY4       |             |
| MS14101-5ACK for d= 5    | MS14101-dCK <sup>1)</sup>   | ENASdRX         |             |
| MS14101-5ACT for d= 5    | MS14101-dCT <sup>1)</sup>   | ENASdRY2        |             |
| MS14101-5ACU for d= 5    | MS14101-dCU <sup>1)</sup>   | ENASdRY4        |             |
| MS14101-5AC for d= 5     | MS14101-dC <sup>1)</sup>    | ENASdR          |             |
| MS14101-5ACPKT for d= 5  | MS14101-dCPKT <sup>1)</sup> | ZENASdRXY2      | SZENASdRXY2 |
| MS14101-5ACP KU for d= 5 | MS14101-dCPKU <sup>1)</sup> | ZENASdRXY4      | SZENASdRXY4 |
| MS14101-5ACP K for d= 5  | MS14101-dCPK <sup>1)</sup>  | ZENASdRX        | SZENASdRX   |
| MS14101-5ACPT for d= 5   | MS14101-dCPT <sup>1)</sup>  | ZENASdRY2       | SZENASdRY2  |
| MS14101-5ACPU for d= 5   | MS14101-dCPU <sup>1)</sup>  | ZENASdRY4       | SZENASdRY4  |
| MS14101-5ACP for d= 5    | MS14101-dCP <sup>1)</sup>   | ZENASdR         | SZENASdR    |
| MS14101-5AEKT for d= 5   | MS14101-dEKT <sup>1)</sup>  | SZNASdRXY2      |             |
| MS14101-5AEKU for d= 5   | MS14101-dEKU <sup>1)</sup>  | SZNASdRXY4      |             |
| MS14101-5AEK for d= 5    | MS14101-dEK <sup>1)</sup>   | SZNASdRX        |             |
| MS14101-5AET for d= 5    | MS14101-dET <sup>1)</sup>   | SZNASdRY2       |             |
| MS14101-5AEU for d= 5    | MS14101-dEU <sup>1)</sup>   | SZNASdRY4       |             |
| MS14101-5AE for d= 5     | MS14101-dE <sup>1)</sup>    | SZNASdR         |             |
| MS14101-5AKT for d= 5    | MS14101-dKT <sup>1)</sup>   | NASdRXY2        |             |
| MS14101-5AKU for d= 5    | MS14101-dKU <sup>1)</sup>   | NASdRXY4        |             |
| MS14101-5AK for d= 5     | MS14101-dK <sup>1)</sup>    | NASdRX          |             |
| MS14101-5AT for d= 5     | MS14101-dT <sup>1)</sup>    | NASdRY2         |             |
| MS14101-5AU for d= 5     | MS14101-dU <sup>1)</sup>    | NASdRY4         |             |
| MS14101-5A for d= 5      | MS14101-d <sup>1)</sup>     | NASdR           |             |
| MS14101-5APKT for d= 5   | MS14101-dPKT <sup>1)</sup>  | ZNASdRXY2       | SZNASdRXY2  |
| MS14101-5APKU for d= 5   | MS14101-dPKU <sup>1)</sup>  | ZNASdRXY4       | SZNASdRXY4  |
| MS14101-5APK for d= 5    | MS14101-dPK <sup>1)</sup>   | ZNASdRX         | SZNASdRX    |
| MS14101-5APT for d= 5    | MS14101-dPT <sup>1)</sup>   | ZNASdRY2        | SZNASdRY2   |
| MS14101-5APU for d= 5    | MS14101-dPU <sup>1)</sup>   | ZNASdRY4        | SZNASdRY4   |
| MS14101-5AP for d= 5     | MS14101-dP <sup>1)</sup>    | ZNASdR          | SZNASdR     |
| MS14104-dCEKT            |                             | SZENASdXY2      |             |
| MS14104-dCEKU            |                             | SZENASdXY4      |             |
| MS14104-dCEK             |                             | SZENASdX        |             |
| MS14104-dCET             |                             | SZENASdY2       |             |
| MS14104-dCEU             |                             | SZENASdY4       |             |
| MS14104-dCE              |                             | SZENASd         |             |



| AS part number         | SKF designation    |                     |
|------------------------|--------------------|---------------------|
| MS14104- <b>d</b> CKT  | ENAS <b>d</b> XY2  |                     |
| MS14104- <b>d</b> CKU  | ENAS <b>d</b> XY4  |                     |
| MS14104- <b>d</b> CK   | ENAS <b>d</b> X    |                     |
| MS14104- <b>d</b> CT   | ENAS <b>d</b> Y2   |                     |
| MS14104- <b>d</b> CU   | ENAS <b>d</b> Y4   |                     |
| MS14104- <b>d</b> C    | ENAS <b>d</b>      |                     |
| MS14104- <b>d</b> CPKT | ZENAS <b>d</b> XY2 | SZENAS <b>d</b> XY2 |
| MS14104- <b>d</b> CPKU | ZENAS <b>d</b> XY4 | SZENAS <b>d</b> XY4 |
| MS14104- <b>d</b> CPK  | ZENAS <b>d</b> X   | SZENAS <b>d</b> X   |
| MS14104- <b>d</b> CPT  | ZENAS <b>d</b> Y2  | SZENAS <b>d</b> Y2  |
| MS14104- <b>d</b> CPU  | ZENAS <b>d</b> Y4  | SZENAS <b>d</b> Y4  |
| MS14104- <b>d</b> CP   | ZENAS <b>d</b>     | SZENAS <b>d</b>     |
| MS14104- <b>d</b> EKT  | SZNAS <b>d</b> XY2 |                     |
| MS14104- <b>d</b> EKU  | SZNAS <b>d</b> XY4 |                     |
| MS14104- <b>d</b> EK   | SZNAS <b>d</b> X   |                     |
| MS14104- <b>d</b> ET   | SZNAS <b>d</b> Y2  |                     |
| MS14104- <b>d</b> EU   | SZNAS <b>d</b> Y4  |                     |
| MS14104- <b>d</b> E    | SZNAS <b>d</b>     |                     |
| MS14104- <b>d</b> KT   | NAS <b>d</b> XY2   |                     |
| MS14104- <b>d</b> KU   | NAS <b>d</b> XY4   |                     |
| MS14104- <b>d</b> K    | NAS <b>d</b> X     |                     |
| MS14104- <b>d</b> T    | NAS <b>d</b> Y2    |                     |
| MS14104- <b>d</b> U    | NAS <b>d</b> Y4    |                     |
| MS14104- <b>d</b>      | NAS <b>d</b>       |                     |
| MS14104- <b>d</b> PKT  | ZNAS <b>d</b> XY2  | SZNAS <b>d</b> XY2  |
| MS14104- <b>d</b> PKU  | ZNAS <b>d</b> XY4  | SZNAS <b>d</b> XY4  |
| MS14104- <b>d</b> PK   | ZNAS <b>d</b> X    | SZNAS <b>d</b> X    |
| MS14104- <b>d</b> P    | ZNAS <b>d</b> Y2   | SZNAS <b>d</b> Y2   |
| MS14104- <b>d</b> PU   | ZNAS <b>d</b> Y4   | SZNAS <b>d</b> Y4   |
| MS14104- <b>d</b> P    | ZNAS <b>d</b>      | SZNAS <b>d</b>      |

Where

**d** = Bore code, with  $d \leq 16$

1) Except for  $d = 5$

#### Example

| AS part number         | SKF designation      |                     |
|------------------------|----------------------|---------------------|
| MS14101- <b>3</b> CEKT | SZENAS <b>3</b> RXY2 |                     |
| MS14101- <b>10</b> PK  | ZNAS <b>10</b> RX    | SZENAS <b>10</b> RX |
| MS14104- <b>6</b> KU   | NAS <b>6</b> XY4     |                     |
| MS14104- <b>12</b> P   | ZNAS <b>12</b>       | SZENAS <b>12</b>    |

## 2 Self-lubricating spherical plain bearings

2

| AS part number                                                             | SKF designation                                                    |
|----------------------------------------------------------------------------|--------------------------------------------------------------------|
| MS14103- <b>d</b> CEKT<br>MS14103- <b>d</b> CEKU<br>MS14103- <b>d</b> CEK  | SZEWA <b>Sd</b> RXY2<br>SZEWA <b>Sd</b> RXY4<br>SZEWA <b>Sd</b> RX |
| MS14103- <b>d</b> CET<br>MS14103- <b>d</b> CEU<br>MS14103- <b>d</b> C      | SZEWA <b>Sd</b> RY2<br>SZEWA <b>Sd</b> RY4<br>SZEWA <b>Sd</b> R    |
| MS14103- <b>d</b> CKT<br>MS14103- <b>d</b> CKU<br>MS14103- <b>d</b> CK     | EWAS <b>d</b> RXY2<br>EWAS <b>d</b> RXY4<br>EWAS <b>d</b> RX       |
| MS14103- <b>d</b> CT<br>MS14103- <b>d</b> CU<br>MS14103- <b>d</b> C        | EWAS <b>d</b> RY2<br>EWAS <b>d</b> RY4<br>EWAS <b>d</b> R          |
| MS14103- <b>d</b> CPKT<br>MS14103- <b>d</b> CPKU<br>MS14103- <b>d</b> CPK  | ZEWA <b>Sd</b> RXY2<br>ZEWA <b>Sd</b> RXY4<br>ZEWA <b>Sd</b> RX    |
| MS14103- <b>d</b> CPT<br>MS14103- <b>d</b> CPU<br>MS14103- <b>d</b> CP     | ZEWA <b>Sd</b> RY2<br>ZEWA <b>Sd</b> RY4<br>ZEWA <b>Sd</b> R       |
| MS14103- <b>d</b> EKT<br>MS14103- <b>d</b> EKU<br>MS14103- <b>d</b> EK     | SZWA <b>Sd</b> RXY2<br>SZWA <b>Sd</b> RXY4<br>SZWA <b>Sd</b> RX    |
| MS14103- <b>d</b> ET<br>MS14103- <b>d</b> EU<br>MS14103- <b>d</b> E        | SZWA <b>Sd</b> RY2<br>SZWA <b>Sd</b> RY4<br>SZWA <b>Sd</b> R       |
| MS14103- <b>d</b> KT<br>MS14103- <b>d</b> KU<br>MS14103- <b>d</b> K        | WAS <b>d</b> RXY2<br>WAS <b>d</b> RXY4<br>WAS <b>d</b> RX          |
| MS14103- <b>d</b> T<br>MS14103- <b>d</b> U<br>MS14103- <b>d</b>            | WAS <b>d</b> RY2<br>WAS <b>d</b> RY4<br>WAS <b>d</b> R             |
| MS14103- <b>d</b> PKT<br>MS14103- <b>d</b> PKU<br>MS14103- <b>d</b> PK     | ZWA <b>Sd</b> RXY2<br>ZWA <b>Sd</b> RXY4<br>ZWA <b>Sd</b> RX       |
| MS14103- <b>d</b> PT<br>MS14103- <b>d</b> PU<br>MS14103- <b>d</b> P        | ZWA <b>Sd</b> RY2<br>ZWA <b>Sd</b> RY4<br>ZWA <b>Sd</b> R          |
| MS14102- <b>d</b> CEKT<br>MS14102- <b>d</b> 'CEKU<br>MS14102- <b>d</b> CEK | SZEWA <b>Sd</b> XY2<br>SZEWA <b>Sd</b> XY4<br>SZEWA <b>Sd</b> X    |
| MS14102- <b>d</b> CET<br>MS14102- <b>d</b> CEU<br>MS14102- <b>d</b> C      | SZEWA <b>Sd</b> Y2<br>SZEWA <b>Sd</b> Y4<br>SZEWA <b>Sd</b>        |

| AS part number                                                            | SKF designation                                              |
|---------------------------------------------------------------------------|--------------------------------------------------------------|
| MS14102- <b>d</b> 'CKT<br>MS14102- <b>d</b> CKU<br>MS14102- <b>d</b> CK   | EWAS <b>d</b> XY2<br>EWAS <b>d</b> XY4<br>EWAS <b>d</b> X    |
| MS14102- <b>d</b> CT<br>MS14102- <b>d</b> CU<br>MS14102- <b>d</b> C       | EWAS <b>d</b> Y2<br>EWAS <b>d</b> Y4<br>EWAS <b>d</b>        |
| MS14102- <b>d</b> CPKT<br>MS14102- <b>d</b> CPKU<br>MS14102- <b>d</b> CPK | ZEWA <b>Sd</b> XY2<br>ZEWA <b>Sd</b> XY4<br>ZEWA <b>Sd</b> X |
| MS14102- <b>d</b> CPT<br>MS14102- <b>d</b> CPU<br>MS14102- <b>d</b> CP    | ZEWA <b>Sd</b> Y2<br>ZEWA <b>Sd</b> Y4<br>ZEWA <b>Sd</b>     |
| MS14102- <b>d</b> EKT<br>MS14102- <b>d</b> EKU<br>MS14102- <b>d</b> EK    | SZWA <b>Sd</b> XY2<br>SZWA <b>Sd</b> XY4<br>SZWA <b>Sd</b> X |
| MS14102- <b>d</b> ET<br>MS14102- <b>d</b> EU<br>MS14102- <b>d</b> E       | SZWA <b>Sd</b> Y2<br>SZWA <b>Sd</b> Y4<br>SZWA <b>Sd</b>     |
| MS14102- <b>d</b> KT<br>MS14102- <b>d</b> KU<br>MS14102- <b>d</b> K       | WAS <b>d</b> XY2<br>WAS <b>d</b> XY4<br>WAS <b>d</b> X       |
| MS14102- <b>d</b> T<br>MS14102- <b>d</b> U<br>MS14102- <b>d</b>           | WAS <b>d</b> Y2<br>WAS <b>d</b> Y4<br>WAS <b>d</b>           |
| MS14102- <b>d</b> PKT<br>MS14102- <b>d</b> PKU<br>MS14102- <b>d</b> PK    | ZWA <b>Sd</b> XY2<br>ZWA <b>Sd</b> XY4<br>ZWA <b>Sd</b> X    |
| MS14102- <b>d</b> PT<br>MS14102- <b>d</b> PU<br>MS14102- <b>d</b> P       | ZWA <b>Sd</b> Y2<br>ZWA <b>Sd</b> Y4<br>ZWA <b>Sd</b>        |

Where

**d** = Bore code, with  $d \leq 16$

### Example

| AS part number                                                                                  | SKF designation                                                                 |
|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| MS14103- <b>3</b> CEKT<br>MS14103- <b>10</b> CP<br>MS14102- <b>6</b> KU<br>MS14102- <b>12</b> P | SZEWA <b>S3</b> RXY2<br>ZEWA <b>S10</b> R<br>WAS <b>6</b> XY4<br>ZWA <b>S12</b> |
|                                                                                                 | SZEWA <b>S10</b> R<br><br>SZWA <b>S12</b>                                       |

| AS part number          | SKF designation       |                       |
|-------------------------|-----------------------|-----------------------|
| M81820/1- <b>d</b> EKT  | SZENAS <b>d</b> ARXY2 |                       |
| M81820/1- <b>d</b> EKU  | SZENAS <b>d</b> ARXY4 |                       |
| M81820/1- <b>d</b> EK   | SZENAS <b>d</b> ARX   |                       |
| M81820/1- <b>d</b> ET   | SZENAS <b>d</b> ARY2  |                       |
| M81820/1- <b>d</b> EU   | SZENAS <b>d</b> ARY4  |                       |
| M81820/1- <b>d</b> E    | SZENAS <b>d</b> AR    |                       |
| M81820/1- <b>d</b> KT   | ENAS <b>d</b> ARXY2   |                       |
| M81820/1- <b>d</b> KU   | ENAS <b>d</b> ARXY4   |                       |
| M81820/1- <b>d</b> K    | ENAS <b>d</b> ARX     |                       |
| M81820/1- <b>d</b> T    | ENAS <b>d</b> ARY2    |                       |
| M81820/1- <b>d</b> U    | ENAS <b>d</b> ARY4    |                       |
| M81820/1- <b>d</b>      | ENAS <b>d</b> AR      |                       |
| M81820/1- <b>d</b> PKT  | ZENAS <b>d</b> ARXY2  | SZENAS <b>d</b> ARXY2 |
| M81820/1- <b>d</b> PKU  | ZENAS <b>d</b> ARXY4  | SZENAS <b>d</b> ARXY4 |
| M81820/1- <b>d</b> PK   | ZENAS <b>d</b> ARX    | SZENAS <b>d</b> ARX   |
| M81820/1- <b>d</b> PT   | ZENAS <b>d</b> ARY2   | SZENAS <b>d</b> ARY2  |
| M81820/1- <b>d</b> PU   | ZENAS <b>d</b> ARY4   | SZENAS <b>d</b> ARY4  |
| M81820/1- <b>d</b> P    | ZENAS <b>d</b> AR     | SZENAS <b>d</b> AR    |
| M81820/1- <b>d</b> EKTD | SZNAS <b>d</b> ARXY2  |                       |
| M81820/1- <b>d</b> EKUD | SZNAS <b>d</b> ARXY4  |                       |
| M81820/1- <b>d</b> EKD  | SZNAS <b>d</b> ARX    |                       |
| M81820/1- <b>d</b> ETD  | SZNAS <b>d</b> ARY2   |                       |
| M81820/1- <b>d</b> EUD  | SZNAS <b>d</b> ARY4   |                       |
| M81820/1- <b>d</b> ED   | SZNAS <b>d</b> AR     |                       |
| M81820/1- <b>d</b> KTD  | NAS <b>d</b> ARXY2    |                       |
| M81820/1- <b>d</b> KUD  | NAS <b>d</b> ARXY4    |                       |
| M81820/1- <b>d</b> KD   | NAS <b>d</b> ARX      |                       |
| M81820/1- <b>d</b> TD   | NAS <b>d</b> ARY2     |                       |
| M81820/1- <b>d</b> UD   | NAS <b>d</b> ARY4     |                       |
| M81820/1- <b>d</b> D    | NAS <b>d</b> AR       |                       |
| M81820/1- <b>d</b> PKTD | ZNAS <b>d</b> ARXY2   | SZNAS <b>d</b> ARXY2  |
| M81820/1- <b>d</b> PKUD | ZNAS <b>d</b> ARXY4   | SZNAS <b>d</b> ARXY4  |
| M81820/1- <b>d</b> PKD  | ZNAS <b>d</b> ARX     | SZNAS <b>d</b> ARX    |
| M81820/1- <b>d</b> PTD  | ZNAS <b>d</b> ARY2    | SZNAS <b>d</b> ARY2   |
| M81820/1- <b>d</b> PUD  | ZNAS <b>d</b> ARY4    | SZNAS <b>d</b> ARY4   |
| M81820/1- <b>d</b> PD   | ZNAS <b>d</b> AR      | SZNAS <b>d</b> AR     |
| M81820/4- <b>d</b> EKT  | SZENAS <b>d</b> AXY2  |                       |
| M81820/4- <b>d</b> EKU  | SZENAS <b>d</b> AXY4  |                       |
| M81820/4- <b>d</b> EK   | SZENAS <b>d</b> AX    |                       |
| M81820/4- <b>d</b> ET   | SZENAS <b>d</b> AY2   |                       |
| M81820/4- <b>d</b> EU   | SZENAS <b>d</b> AY4   |                       |
| M81820/4- <b>d</b> E    | SZENAS <b>d</b> A     |                       |

| AS part number          | SKF designation     |                      |
|-------------------------|---------------------|----------------------|
| M81820/4- <b>d</b> KT   | ENAS <b>d</b> AXY2  |                      |
| M81820/4- <b>d</b> KU   | ENAS <b>d</b> AXY4  |                      |
| M81820/4- <b>d</b> K    | ENAS <b>d</b> AX    |                      |
| M81820/4- <b>d</b> T    | ENAS <b>d</b> AY2   |                      |
| M81820/4- <b>d</b> U    | ENAS <b>d</b> AY4   |                      |
| M81820/4- <b>d</b>      | ENAS <b>d</b> A     |                      |
| M81820/4- <b>d</b> PKT  | ZENAS <b>d</b> AXY2 | SZENAS <b>d</b> AXY2 |
| M81820/4- <b>d</b> PKU  | ZENAS <b>d</b> AXY4 | SZENAS <b>d</b> AXY4 |
| M81820/4- <b>d</b> PK   | ZENAS <b>d</b> AX   | SZENAS <b>d</b> AX   |
| M81820/4- <b>d</b> PT   | ZENAS <b>d</b> AY2  | SZENAS <b>d</b> AY2  |
| M81820/4- <b>d</b> PU   | ZENAS <b>d</b> AY4  | SZENAS <b>d</b> AY4  |
| M81820/4- <b>d</b> P    | ZENAS <b>d</b> A    | SZENAS <b>d</b> A    |
| M81820/4- <b>d</b> EKTD | SZNAS <b>d</b> AXY2 |                      |
| M81820/4- <b>d</b> EKUD | SZNAS <b>d</b> AXY4 |                      |
| M81820/4- <b>d</b> EKD  | SZNAS <b>d</b> AX   |                      |
| M81820/4- <b>d</b> ETD  | SZNAS <b>d</b> AY2  |                      |
| M81820/4- <b>d</b> EUD  | SZNAS <b>d</b> AY4  |                      |
| M81820/4- <b>d</b> ED   | SZNAS <b>d</b> A    |                      |
| M81820/4- <b>d</b> KTD  | NAS <b>d</b> AXY2   |                      |
| M81820/4- <b>d</b> KUD  | NAS <b>d</b> AXY4   |                      |
| M81820/4- <b>d</b> KD   | NAS <b>d</b> AX     |                      |
| M81820/4- <b>d</b> TD   | NAS <b>d</b> AY2    |                      |
| M81820/4- <b>d</b> UD   | NAS <b>d</b> AY4    |                      |
| M81820/4- <b>d</b> D    | NAS <b>d</b> A      |                      |
| M81820/4- <b>d</b> PKTD | ZNAS <b>d</b> AXY2  | SZNAS <b>d</b> AXY2  |
| M81820/4- <b>d</b> PKUD | ZNAS <b>d</b> AXY4  | SZNAS <b>d</b> AXY4  |
| M81820/4- <b>d</b> PKD  | ZNAS <b>d</b> AX    | SZNAS <b>d</b> AX    |
| M81820/4- <b>d</b> PTD  | ZNAS <b>d</b> AY2   | SZNAS <b>d</b> AY2   |
| M81820/4- <b>d</b> PUD  | ZNAS <b>d</b> AY4   | SZNAS <b>d</b> AY4   |
| M81820/4- <b>d</b> PD   | ZNAS <b>d</b> A     | SZNAS <b>d</b> A     |

Where

**d** = Bore code, with  $4 \leq d \leq 16$ **Example**

| AS part number         | SKF designation       |                      |
|------------------------|-----------------------|----------------------|
| M81820/1- <b>5</b> EKT | SZENAS <b>5</b> ARXY2 |                      |
| M81820/1- <b>10</b> PK | ZENAS <b>10</b> ARX   | SZENAS <b>10</b> ARX |
| M81820/4- <b>6</b> UD  | NAS <b>6</b> AY4      |                      |
| M81820/4- <b>12</b> PD | ZNAS <b>12</b> A      | SZNAS <b>12</b> A    |

## 2 Self-lubricating spherical plain bearings

2

| AS part number          | SKF designation       |                       |
|-------------------------|-----------------------|-----------------------|
| M81820/3- <b>d</b> EKT  | SZEWA <b>Sd</b> ARXY2 |                       |
| M81820/3- <b>d</b> EKU  | SZEWA <b>Sd</b> ARXY4 |                       |
| M81820/3- <b>d</b> EK   | SZEWA <b>Sd</b> ARX   |                       |
| M81820/3- <b>d</b> ET   | SZEWA <b>Sd</b> ARY2  |                       |
| M81820/3- <b>d</b> EU   | SZEWA <b>Sd</b> ARY4  |                       |
| M81820/3- <b>d</b> E    | SZEWA <b>Sd</b> AR    |                       |
| M81820/3- <b>d</b> KT   | EWAS <b>d</b> ARXY2   |                       |
| M81820/3- <b>d</b> KU   | EWAS <b>d</b> ARXY4   |                       |
| M81820/3- <b>d</b> K    | EWAS <b>d</b> ARX     |                       |
| M81820/3- <b>d</b> T    | EWAS <b>d</b> ARY2    |                       |
| M81820/3- <b>d</b> U    | EWAS <b>d</b> ARY4    |                       |
| M81820/3- <b>d</b>      | EWAS <b>d</b> AR      |                       |
| M81820/3- <b>d</b> PKT  | ZEWA <b>Sd</b> ARXY2  | SZEWA <b>Sd</b> ARXY2 |
| M81820/3- <b>d</b> PKU  | ZEWA <b>Sd</b> ARXY4  | SZEWA <b>Sd</b> ARXY4 |
| M81820/3- <b>d</b> PK   | ZEWA <b>Sd</b> ARX    | SZEWA <b>Sd</b> ARX   |
| M81820/3- <b>d</b> PT   | ZEWA <b>Sd</b> ARY2   | SZEWA <b>Sd</b> ARY2  |
| M81820/3- <b>d</b> PU   | ZEWA <b>Sd</b> ARY4   | SZEWA <b>Sd</b> ARY4  |
| M81820/3- <b>d</b> P    | ZEWA <b>Sd</b> AR     | SZEWA <b>Sd</b> AR    |
| M81820/3- <b>d</b> EKTD | SZWAS <b>d</b> ARXY2  |                       |
| M81820/3- <b>d</b> EKUD | SZWAS <b>d</b> ARXY4  |                       |
| M81820/3- <b>d</b> EKD  | SZWAS <b>d</b> ARX    |                       |
| M81820/3- <b>d</b> ETD  | SZWAS <b>d</b> ARY2   |                       |
| M81820/3- <b>d</b> EUD  | SZWAS <b>d</b> ARY4   |                       |
| M81820/3- <b>d</b> ED   | SZWAS <b>d</b> AR     |                       |
| M81820/3- <b>d</b> KTD  | WAS <b>d</b> ARXY2    |                       |
| M81820/3- <b>d</b> KUD  | WAS <b>d</b> ARXY4    |                       |
| M81820/3- <b>d</b> KD   | WAS <b>d</b> ARX      |                       |
| M81820/3- <b>d</b> TD   | WAS <b>d</b> ARY2     |                       |
| M81820/3- <b>d</b> UD   | WAS <b>d</b> ARY4     |                       |
| M81820/3- <b>d</b> D    | WAS <b>d</b> AR       |                       |
| M81820/3- <b>d</b> PKTD | ZWAS <b>d</b> ARXY2   | SZWAS <b>d</b> ARXY2  |
| M81820/3- <b>d</b> PKUD | ZWAS <b>d</b> ARXY4   | SZWAS <b>d</b> ARXY4  |
| M81820/3- <b>d</b> PKD  | ZWAS <b>d</b> ARX     | SZWAS <b>d</b> ARX    |
| M81820/3- <b>d</b> PTD  | ZWAS <b>d</b> ARY2    | SZWAS <b>d</b> ARY2   |
| M81820/3- <b>d</b> PUD  | ZWAS <b>d</b> ARY4    | SZWAS <b>d</b> ARY4   |
| M81820/3- <b>d</b> PD   | ZWAS <b>d</b> AR      | SZWAS <b>d</b> AR     |
| M81820/2- <b>d</b> EKT  | SZEWA <b>Sd</b> AXY2  |                       |
| M81820/2- <b>d</b> EKU  | SZEWA <b>Sd</b> AXY4  |                       |
| M81820/2- <b>d</b> EK   | SZEWA <b>Sd</b> AX    |                       |
| M81820/2- <b>d</b> ET   | SZEWA <b>Sd</b> AY2   |                       |
| M81820/2- <b>d</b> EU   | SZEWA <b>Sd</b> AY4   |                       |
| M81820/2- <b>d</b> E    | SZEWA <b>Sd</b> A     |                       |

| AS part number          | SKF designation     |                      |
|-------------------------|---------------------|----------------------|
| M81820/2- <b>d</b> KT   | EWAS <b>d</b> AXY2  |                      |
| M81820/2- <b>d</b> KU   | EWAS <b>d</b> AXY4  |                      |
| M81820/2- <b>d</b> K    | EWAS <b>d</b> AX    |                      |
| M81820/2- <b>d</b> T    | EWAS <b>d</b> AY2   |                      |
| M81820/2- <b>d</b> U    | EWAS <b>d</b> AY4   |                      |
| M81820/2- <b>d</b>      | EWAS <b>d</b> A     |                      |
| M81820/2- <b>d</b> PKT  | ZEWA <b>Sd</b> AXY2 | SZEWA <b>Sd</b> AXY2 |
| M81820/2- <b>d</b> PKU  | ZEWA <b>Sd</b> AXY4 | SZEWA <b>Sd</b> AXY4 |
| M81820/2- <b>d</b> PK   | ZEWA <b>Sd</b> AX   | SZEWA <b>Sd</b> AX   |
| M81820/2- <b>d</b> PT   | ZEWA <b>Sd</b> AY2  | SZEWA <b>Sd</b> AY2  |
| M81820/2- <b>d</b> PU   | ZEWA <b>Sd</b> AY4  | SZEWA <b>Sd</b> AY4  |
| M81820/2- <b>d</b> P    | ZEWA <b>Sd</b> A    | SZEWA <b>Sd</b> A    |
| M81820/2- <b>d</b> EKTD | SZWAS <b>d</b> AXY2 |                      |
| M81820/2- <b>d</b> EKUD | SZWAS <b>d</b> AXY4 |                      |
| M81820/2- <b>d</b> EKD  | SZWAS <b>d</b> AX   |                      |
| M81820/2- <b>d</b> ETD  | SZWAS <b>d</b> AY2  |                      |
| M81820/2- <b>d</b> EUD  | SZWAS <b>d</b> AY4  |                      |
| M81820/2- <b>d</b> 'ED  | SZWAS <b>d</b> A    |                      |
| M81820/2- <b>d</b> KTD  | WAS <b>d</b> AXY2   |                      |
| M81820/2- <b>d</b> KUD  | WAS <b>d</b> AXY4   |                      |
| M81820/2- <b>d</b> KD   | WAS <b>d</b> AX     |                      |
| M81820/2- <b>d</b> TD   | WAS <b>d</b> AY2    |                      |
| M81820/2- <b>d</b> UD   | WAS <b>d</b> AY4    |                      |
| M81820/2- <b>d</b> D    | WAS <b>d</b> A      |                      |
| M81820/2- <b>d</b> PKTD | ZWAS <b>d</b> AXY2  | SZWAS <b>d</b> AXY2  |
| M81820/2- <b>d</b> PKUD | ZWAS <b>d</b> AXY4  | SZWAS <b>d</b> AXY4  |
| M81820/2- <b>d</b> PKD  | ZWAS <b>d</b> AX    | SZWAS <b>d</b> AX    |
| M81820/2- <b>d</b> PTD  | ZWAS <b>d</b> AY2   | SZWAS <b>d</b> AY2   |
| M81820/2- <b>d</b> PUD  | ZWAS <b>d</b> AY4   | SZWAS <b>d</b> AY4   |
| M81820/2- <b>d</b> PD   | ZWAS <b>d</b> A     | SZWAS <b>d</b> A     |

Where

**d** = Bore code, with  $5 \leq d \leq 16$

### Example

| AS part number          | SKF designation      |                       |
|-------------------------|----------------------|-----------------------|
| M81820/3- <b>5</b> EKT  | SZEWA <b>5</b> ARXY2 |                       |
| M81820/3- <b>10</b> PKU | ZEWA <b>10</b> ARXY4 | SZEWA <b>10</b> ARXY4 |
| M81820/2- <b>6</b> EUD  | SZWAS <b>6</b> AY4   |                       |
| M81820/2- <b>12</b> PD  | ZWAS <b>12</b> A     | SZWAS <b>12</b> A     |

| NSA part number      | SKF designation              |
|----------------------|------------------------------|
| NSA8134- <b>d</b> 'X | SN <b>d</b> ZX <sup>1)</sup> |
| NSA8134- <b>d</b> '  | SN <b>d</b> Z <sup>1)</sup>  |
| NSA8136- <b>d</b> 'X | SN <b>d</b> GX <sup>1)</sup> |
| NSA8136- <b>d</b> '  | SN <b>d</b> G <sup>1)</sup>  |

Where

**d** = Bore code (multiples of 1/16 inch)

**d**' = d for d ≤ 20

28 for d = 28PR

<sup>1)</sup> Except for d = 24, d = 28 and d = 32

#### Example

| NSA part number      | SKF designation |
|----------------------|-----------------|
| NSA8134- <b>04</b> X | SN <b>04</b> ZX |
| NSA8136- <b>10</b>   | SN <b>10</b> G  |

| NSA part number     | SKF designation |
|---------------------|-----------------|
| NSA8135- <b>d</b> X | SW <b>d</b> ZX  |
| NSA8135- <b>d</b>   | SW <b>d</b> Z   |
| NSA8137- <b>d</b> X | SW <b>d</b> GX  |
| NSA8137- <b>d</b>   | SW <b>d</b> G   |

Where

**d** = Bore code (multiples of 1/16 inch)

#### Example

| NSA part number      | SKF designation |
|----------------------|-----------------|
| NSA8135- <b>04</b> X | SW <b>04</b> ZX |
| NSA8137- <b>10</b>   | SW <b>10</b> G  |



## Rod ends



# 3 Rod ends

|                                                                                                            |            |                                                                                                                  |            |
|------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------|------------|
| <b>Designs and variants</b> .....                                                                          | <b>282</b> | <b>3.10</b> External thread inserted high misalignment metal-to-metal spherical plain bearing rod end. ....      | <b>314</b> |
| Optional SKF design features .....                                                                         | 284        | <b>3.11</b> External thread inserted self-lubricating spherical plain bearing rod end. ....                      | 316        |
| Customized rod ends .....                                                                                  | 284        | <b>3.12</b> Internal thread inserted wide self-lubricating spherical plain bearing rod end. ....                 | 318        |
| Rod end bearing types selection criteria .....                                                             | 284        | <b>3.13</b> Internal thread inserted high misalignment self-lubricating spherical plain bearing rod end. ....    | 320        |
| <b>General specifications</b> .....                                                                        | <b>285</b> | <b>Inch dimensions</b> .....                                                                                     | <b>322</b> |
| Ball bearing rod ends .....                                                                                | 285        | <b>3.14</b> External thread rod end with integrated rolling bearing. .                                           | 322        |
| Design .....                                                                                               | 285        | <b>3.15</b> External thread rod end with integrated rolling bearing, EN 4156, EN 4157 .....                      | 326        |
| Selecting rod end size and options .....                                                                   | 285        | <b>3.16</b> External thread rod end with integrated rolling bearing, AS 21151 .....                              | 332        |
| Lubrication .....                                                                                          | 285        | <b>3.17</b> Internal thread rod end with integrated rolling bearing, AS 21153 .....                              | 334        |
| Operating temperature .....                                                                                | 285        | <b>3.18</b> External inserted wide metal-to-metal spherical plain bearing rod end. ....                          | 336        |
| Friction and torque .....                                                                                  | 285        | <b>3.19</b> External thread rod end with Inserted metal-to-metal high misalignment spherical plain bearing. .... | 338        |
| Rod end data .....                                                                                         | 286        | <b>3.20</b> Internal thread inserted wide metal-to-metal spherical plain bearing rod end. ....                   | 340        |
| Metal-to-metal spherical plain bearing rod ends .....                                                      | 287        | <b>3.21</b> Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end. ....      | 342        |
| Design .....                                                                                               | 287        | <b>3.22</b> External thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/1 .....     | 344        |
| Selecting rod end size and options .....                                                                   | 287        | <b>3.23</b> External thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/4 .....     | 346        |
| Lubrication .....                                                                                          | 288        | <b>3.24</b> External thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/6 .....   | 348        |
| Internal clearance .....                                                                                   | 289        | <b>3.25</b> External thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/8 .....   | 350        |
| Operating temperature .....                                                                                | 289        | <b>3.26</b> External thread self-lubricating spherical plain bearing rod end, NSA 8143. ....                     | 352        |
| Rod end data .....                                                                                         | 289        | <b>3.27</b> External thread inserted wide self-lubricating spherical plain bearing rod end. ....                 | 354        |
| Self-lubricating spherical plain bearing rod ends .....                                                    | 291        | <b>3.28</b> External thread inserted self-lubricating spherical plain bearing rod end. ....                      | 356        |
| Design .....                                                                                               | 291        | <b>3.29</b> Internal thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/2 .....     | 358        |
| Selecting rod end size and options .....                                                                   | 291        | <b>3.30</b> Internal thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/5 .....     | 362        |
| Friction and torque .....                                                                                  | 291        | <b>3.31</b> Internal thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/7. ....   | 366        |
| Operating temperature .....                                                                                | 291        | <b>3.32</b> Internal thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/9 .....   | 370        |
| Rod end data .....                                                                                         | 291        | <b>3.33</b> Internal thread inserted self-lubricating spherical plain bearing rod end. ....                      | 374        |
| Rod end bodies .....                                                                                       | 292        | <b>3.34</b> Internal thread inserted wide self-lubricating spherical plain bearing rod end. ....                 | 378        |
| Rod end body load carrying capability .....                                                                | 292        | <b>3.35</b> Internal thread inserted high misalignment self-lubricating spherical plain bearing rod end. ....    | 380        |
| Rod end head shape .....                                                                                   | 293        | <b>Cross-reference</b> .....                                                                                     | <b>382</b> |
| Rod end body features .....                                                                                | 293        | Ball bearing rod ends .....                                                                                      | 382        |
| <b>Bearing handling</b> .....                                                                              | <b>294</b> | Self-lubricating spherical plain bearing rod ends .....                                                          | 386        |
| Mounting .....                                                                                             | 294        |                                                                                                                  |            |
| Dismounting .....                                                                                          | 294        |                                                                                                                  |            |
| Storage .....                                                                                              | 294        |                                                                                                                  |            |
| <b>Customized products</b> .....                                                                           | <b>295</b> |                                                                                                                  |            |
| Legacy products .....                                                                                      | 295        |                                                                                                                  |            |
| Legacy standards .....                                                                                     | 295        |                                                                                                                  |            |
| <b>Product tables</b> .....                                                                                |            |                                                                                                                  |            |
| <b>Metric dimensions</b> .....                                                                             | <b>296</b> |                                                                                                                  |            |
| <b>3.1</b> External thread rod end with integrated rolling bearing, EN 3541, EN 4036. ....                 | 296        |                                                                                                                  |            |
| <b>3.2</b> External thread rod end with integrated rolling bearing. .                                      | 298        |                                                                                                                  |            |
| <b>3.3</b> External thread integrated metal-to-metal spherical plain bearing rod end. ....                 | 300        |                                                                                                                  |            |
| <b>3.4</b> External thread inserted wide metal-to-metal spherical plain bearing rod end. ....              | 302        |                                                                                                                  |            |
| <b>3.5</b> External thread inserted high misalignment metal-to-metal spherical plain bearing rod end. .... | 304        |                                                                                                                  |            |
| <b>3.6</b> Internal thread rod end with integrated metal-to-metal spherical plain bearing. ....            | 306        |                                                                                                                  |            |
| <b>3.7</b> Internal thread inserted wide metal-to-metal spherical plain bearing rod end. ....              | 308        |                                                                                                                  |            |
| <b>3.8</b> Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end. .... | 310        |                                                                                                                  |            |
| <b>3.9</b> External thread rod end with integrated rolling bearing. .                                      | 312        |                                                                                                                  |            |

# 3 Rod ends

Rod ends are ready-to-mount airframe bearing solutions with threaded shanks. They provide the same functions as the bearing they use, together with an easy attachment and positioning solution to the application. Rod ends are available with spherical plain bearings or rolling bearings.

Refer to *Rod end bearing types selection criteria* **page 284**.

The standard range of SKF rod ends is tailored to meet a variety of operating conditions:

- Load: from low to high, for static or dynamic conditions
- Motion: from quasi-static to highly dynamic, including low to high frequency oscillation
- Environment: for a range of operating temperatures and environmental conditions

Airframe rod ends are used widely in aircraft structures and dynamic systems. They can be found in many applications including:

- Flight controls
- Actuators, attachment points and hinges
- Doors
- Helicopter rotors

SKF application engineers can provide additional help to select the most suitable standard rod end solution or design a customized rod end to meet your application requirements.

## Designs and variants

The standard assortment of SKF rod ends is comprised of:

- Rod ends with integrated self-aligning ball bearings
- Rod ends with integrated metal-to-metal spherical plain bearings
- Rod ends with inserted metal-to-metal or self-lubricating spherical plain bearings

See **figure 1**.

For detailed information about which type of bearing is most suitable for a given application, refer to *Rod end bearing types selection criteria* **page 284**.

The SKF standard range of rod ends is listed in **table 1** for metric rod ends and in **table 2** for inch sizes.

**Figure 1**

### Terminology

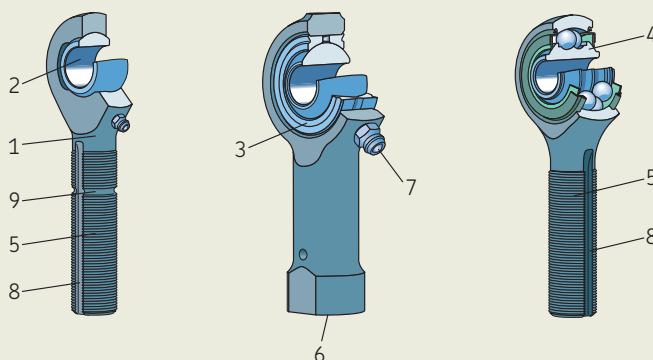




Table 1

## SKF rod ends, metric dimensions

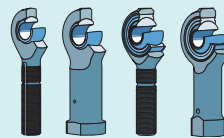
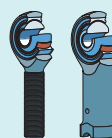
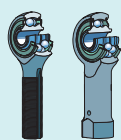
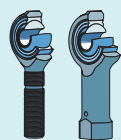
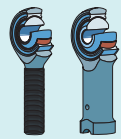
| Type                      |                                                                                   |            | Thread   | Standard         | SKF rod end series      | SKF bearing series | Table number | Page |
|---------------------------|-----------------------------------------------------------------------------------|------------|----------|------------------|-------------------------|--------------------|--------------|------|
| Ball bearing rod ends     |  | Integrated | External | EN 3541, EN 4036 | C..MJ, CN..MJ           | N/A                | 3.1          | 296  |
|                           |                                                                                   | Integrated | External | –                | C..M, CN..M, CN..M..SP1 | N/A                | 3.2          | 298  |
| Metal-to-metal rod ends   |  | Integrated | External | –                | EM..                    | N/A                | 3.3          | 300  |
|                           |                                                                                   | Inserted   | External | –                | EMJ/ML..                | ML..R metric       | 3.4          | 302  |
|                           |                                                                                   | Inserted   | External | –                | EMJ/MT..                | MT..R metric       | 3.5          | 304  |
|                           |                                                                                   | Integrated | Internal | –                | EF..                    | N/A                | 3.6          | 306  |
|                           |                                                                                   | Inserted   | Internal | –                | EFJ/ML..                | ML..R metric       | 3.7          | 308  |
|                           |                                                                                   | Inserted   | Internal | –                | EFJ/MT..                | MT..R metric       | 3.8          | 310  |
| Self-lubricating rod ends |  | Inserted   | External | EN 2498, EN 4198 | EMA..                   | HMEN..R metric     | 3.9          | 312  |
|                           |                                                                                   | Inserted   | External | –                | EMJ/RL..                | WEN..R metric      | 3.10         | 314  |
|                           |                                                                                   | Inserted   | External | –                | EMJ/RT..                | XRT..R metric      | 3.11         | 316  |
|                           |                                                                                   | Inserted   | Internal | –                | EFJ/RL..                | WEN..R metric      | 3.12         | 318  |
|                           |                                                                                   | Inserted   | Internal | –                | EFJ/RT..                | XRT..R metric      | 3.13         | 320  |

Table 2

## SKF rod ends, inch dimensions

| Type                      |                                                                                     |            | Thread   | Standard         | SKF rod end series        | SKF bearing series        | Table number | Page |
|---------------------------|-------------------------------------------------------------------------------------|------------|----------|------------------|---------------------------|---------------------------|--------------|------|
| Ball bearing rod ends     |  | Integrated | External | –                | CN..SP                    | N/A                       | 3.14         | 322  |
|                           |                                                                                     | Integrated | External | EN 4156, EN 4157 | CN..                      | N/A                       | 3.15         | 326  |
|                           |                                                                                     | Integrated | External | AS 21151         | REP..M, RA..M, RAP..M     | N/A                       | 3.16         | 332  |
|                           |                                                                                     | Integrated | Internal | AS 21153         | REP.., REP..F., REPB..N.. | N/A                       | 3.17         | 334  |
| Metal-to-metal rod ends   |  | Inserted   | External | –                | EMJ/..ML..R               | ML..R inch                | 3.18         | 336  |
|                           |                                                                                     | Inserted   | External | –                | EMJ/..MT..R               | MT..R inch                | 3.19         | 338  |
|                           |                                                                                     | Inserted   | Internal | –                | EFJ/..ML..R               | ML..R inch                | 3.20         | 340  |
|                           |                                                                                     | Inserted   | Internal | –                | EFJ/..MT..R               | MT..R inch                | 3.21         | 342  |
| Self-lubricating rod ends |  | Inserted   | External | AS 81935/1       | MJ/WAS..                  | WAS..R inch, EWAS..R inch | 3.22         | 344  |
|                           |                                                                                     | Inserted   | External | AS 81935/4       | MJ/NAS..                  | NAS..R inch, ENAS..R inch | 3.23         | 346  |
|                           |                                                                                     | Inserted   | External | AS 81935/6       | PHMJ/WAS..                | WAS..R inch, EWAS..R inch | 3.24         | 348  |
|                           |                                                                                     | Inserted   | External | AS 81935/8       | PHMJ/NAS..                | NAS..R inch, ENAS..R inch | 3.25         | 350  |
|                           |                                                                                     | Inserted   | External | NSA 8143         | R..M..                    | SW..G inch                | 3.26         | 352  |
|                           |                                                                                     | Inserted   | External | –                | EMJ/RL..R                 | WAS..R inch               | 3.27         | 354  |
|                           |                                                                                     | Inserted   | External | –                | EMJ/RT..R                 | XRT..R inch               | 3.28         | 356  |
|                           |                                                                                     | Inserted   | Internal | AS 81935/2       | FJ/WAS..                  | WAS..R inch, EWAS..R inch | 3.29         | 358  |
|                           |                                                                                     | Inserted   | Internal | AS 81935/5       | FJ/NAS..                  | NAS..R inch, ENAS..R inch | 3.30         | 362  |
|                           |                                                                                     | Inserted   | Internal | AS 81935/7       | PHFJ/WAS..                | WAS..R inch, EWAS..R inch | 3.31         | 366  |
|                           |                                                                                     | Inserted   | Internal | AS 81935/9       | PHFJ/NAS..                | NAS..R inch, ENAS..R inch | 3.32         | 370  |
|                           |                                                                                     | Inserted   | Internal | NSA 8149         | R..F..                    | SW..G inch                | 3.33         | 374  |
|                           |                                                                                     | Inserted   | Internal | –                | EFJ/RL..R                 | WAS..R inch               | 3.34         | 378  |
|                           |                                                                                     | Inserted   | Internal | –                | EFJ/RT..R                 | XRT..R inch               | 3.35         | 380  |

## Optional SKF design features

The standard assortment of SKF rod ends also includes a large variety of optional design features to meet specific application needs. The most common options are:

- Keyways or locating grooves in the rod end body for positioning, refer to **page 293**
- External (male) or internal (female) thread types to adapt to the application interface, refer to **page 293**
- Lubrication features, refer to **page 288**, Sealing solutions, refer to **pages 286, 290 and 292**, corrosion-resistant materials, refer to **pages 286, 289 and 291** and surface treatments, refer to **pages 286, 290 and 292** for optimal rod end performance in different operating conditions

## Customized rod ends

SKF supplies customized and engineered rod ends to meet specific airframe application requirements. These solutions are the result of SKF's extensive experience and close cooperation between SKF and the customer's application experts.

SKF provides total solutions over the full bearing life cycle, including design, testing and partnership.

For additional information, refer to *Customized products* **page 295**.

Contact your regional SKF partner via: [www.skf.com/go/aero](http://www.skf.com/go/aero).

## Rod end bearing types selection criteria

The selection of the rod end type needed to meet the operating conditions depends mostly on the capabilities of the bearing type used in the rod end (rolling bearing, self-lubricating spherical plain bearing or metal-to-metal spherical plain bearing).

Refer to **table 11** in Airframe introduction **page 28** to select a bearing type (rolling or spherical plain bearing) that is suitable for the application requirements.

Then:

- For spherical plain bearings, refer to **table 2** in *Spherical plain bearings* **chapter page 131** for selection guidelines between metal-to-metal or self-lubricating bearing types
- For rolling bearings, refer to *Rolling bearings* **chapter page 30** for more information

With the selected bearing type, refer to the relevant rod end section for detailed information:

- *Ball bearing rod end* **page 285**
- *Metal-to-metal spherical plain bearing rod end* **page 287**
- *Self-lubricating spherical plain bearing rod end* **page 291**

# General specifications

## Ball bearing rod ends

### Design

Ball bearing rod ends use an integrated self-aligning ball bearing. Where "integrated" means the balls run on a double row inner ring and a spherical raceway in the rod end head. For more information about self-aligning ball bearings, refer to *Rolling bearings* page 30.

### Selecting rod end size and options

If you are looking for a known rod end, according to its standard for example, or if you are an experienced rod end and bearing expert, use **table 1** and **2** to find the relevant product table.

For help in selecting the appropriate rod end size and options, follow these steps:

- 1 Select external or internal thread type depending on the design of the application attachment point, refer to **page 293**
- 2 Determine the range of allowable interface dimensions for the rod end. Often the boundary dimensions are predetermined by the space available on the aircraft system. Typically, the shaft diameter determines the bore diameter.
- 3 Determine the static radial and axial loads *Rod end body load carrying capability* **page 292**.
- 4 Determine the swivelling angle capability required for the application.
- 5 From the product tables, find a rod end series with sufficient static load carrying capability and swivelling angle capability that best fits the required dimensions.

Example: When selecting a rod end with external thread, a maximum rod end length of 70 mm, a static radial limit load capacity of 3.5 kN and an axial static limit load capacity of 1 kN, then a C5MJ can be selected if the swivelling angle capability is sufficient.

- 6 Choose all other required options, including lubrication **page 285**, material **page 286** and surface treatment **page 286**.

If the standard SKF range of rolling bearing rod ends does not meet your specific needs, contact SKF for a customized products solution, as described in *Customized products* **page 295**.

### Lubrication

Greases used in SKF ball bearing rod ends are listed in **table 3**. The standard grease options are listed in each relevant product table.

At least 80% of the free space in the bearing is filled with grease. The bearings are lubricated for life and cannot be relubricated.

Lubrication is primarily chosen according to the operating temperature.

For operation outside the allowable temperature range of the greases, the rod end and bearing life may be reduced. Contact SKF for more information.

### Operating temperature

The permissible operating temperature of ball bearing rod ends is typically limited by the grease capability. Refer to *Lubrication* for more information about grease temperature limits.

### Friction and torque

Values for rotational and swivelling starting torques, as defined in *Rolling bearings – Friction and torque* **page 41**, are listed in the relevant product tables.

3

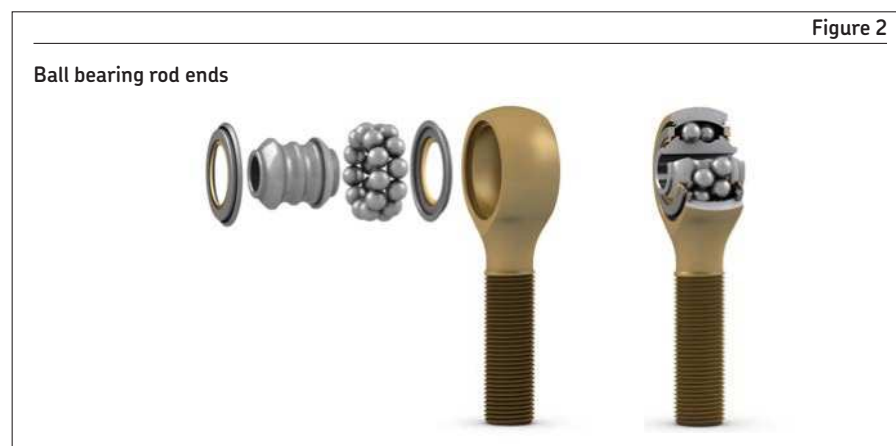


Table 3

| Standard greases |                       |                                   |
|------------------|-----------------------|-----------------------------------|
| NATO codes       | Standard              | Operating temperature             |
| G354             | MIL PRF 23827 type I  | –73 to +121 °C<br>–100 to +250 °F |
| –                | MIL PRF 23827 type II | –73 to +121 °C<br>–100 to +250 °F |
| G395             | MIL PRF 81322         | –54 to +177 °C<br>–64 to +350 °F  |

## Rod end data

### Material

The bodies of ball bearing rod ends use case hardening steel materials with a soft core and hard surface, providing increased mechanical resistance, see **table 4**.

Bearing inner ring and rolling elements use the standard materials defined in *Rolling bearings – Material* **page 45**: Bearing steel 100C6 or corrosion-resistant steel 440C.

The standard surface treatment options are zinc-nickel or cadmium plating. See the relevant product tables.

- Cadmium plating is applied according to AMS-QQ-P-416. This treatment can include chromium 6 compounds and may be subject to environmental legislation
- Zinc-nickel plating is a chromium 6 free alternative to cadmium plating, compliant to environmental legislation. Zinc-nickel plating is applied in accordance with AMS 2417

### Surface treatment

Rod ends can be exposed to various environmental conditions including humidity, heat and fluids. These can limit the bearing life or performance by increasing the risk of contamination and corrosion.

Therefore, SKF supplies surface treatments for increased general corrosion resistance and increased fretting resistance.

These surface treatments are applied to the rod end body, but not to the raceways.

Rod end interface dimensions and tolerances from product tables are not modified when surface treatments are used.

For other surface treatments for specific purposes, refer to *Customized products* **page 295** and contact SKF.

### Sealing solutions

Ball bearing rod ends are supplied as standard with shielding or sealing solutions as a protection against environmental conditions. For the design of the seal and shield, refer to *Rolling bearings – Sealing and shielding* **page 47**.

Table 4

#### Standard materials for ball bearing rod end bodies

| Body material type                       | Raceway surface hardness HRC                                            | Cross-sectional hardness HRC                                                                                          | Cross-sectional Rm MPa  | Corrosion resistance | Material designation | EN      | AMS      | Equivalent designation |
|------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------|----------------------|---------|----------|------------------------|
| Case hardening alloy steel               | For EN series ≥ 58<br>For AS series = 59 to 63<br>For other series ≥ 60 | For AS series = 15 <sup>1)</sup> to 45 for rod end shank and 32 to 48 for rod end head<br>For other series = 20 to 40 | For EN series > 830     | Moderate             | 9315                 | EN 2099 | AMS 6263 | 16NCD13                |
| Case hardening corrosion-resistant steel | ≥ 60                                                                    | 20 to 40                                                                                                              | No standard requirement | Good                 | 431                  | EN 3490 | AMS 5628 | Z15CN17.03             |

<sup>1)</sup> Equivalent to 92,5 HRB

# Metal-to-metal spherical plain bearing rod ends

## Design

Metal-to-metal rod ends consist of either:

- An integrated bearing, where "integrated" means the inner ring slides on a spherical surface machined in the rod end head. The rod end body serves as an outer ring (**figure 3**)
- A standard metal-to-metal spherical plain bearing inserted into a rod end body (**figure 4**)

Rod ends with integrated bearings have better fatigue resistance than the same size rod ends with inserted metal-to-metal spherical plain bearings. For more information refer to *Dynamic load for rod ends with inserted bearings* **page 292**.

## Selecting rod end size and options

### Integrated bearing

If you are looking for a known rod end or if you are an experienced rod end and bearing expert, use **table 1** and **2** to find the relevant product table.

For help in selecting the appropriate rod end size and options, follow these steps:

- 1 Select external or internal thread type depending on the design of the application attachment point, refer to **page 293**
- 2 Determine the range of allowable interface dimensions for the rod end. Often the boundary dimensions are predetermined by the space available on the aircraft system. Typically, the shaft diameter determines the bearing's bore diameter.
- 3 Determine the static radial and axial load requirements. For more information, refer to *Rod end body load carrying capability* **page 292**.
- 4 Determine the swivelling angle capability required for the application.
- 5 From the product tables, find a rod end series with sufficient static load carrying capability and swivelling angle capability that best fits the required dimensions.

### Example

When selecting a rod end with external thread, a maximum rod end length of 160 mm and a static radial ultimate load capacity of 160 kN, then an EM20 can be selected if the swivelling angle capability is sufficient.

- 6 Depending on the operating and load conditions (static or dynamic), select an appropriate material and surface treatment combination. Integrated bearings with a bronze inner ring are typically used for endurance applications. Integrated bearings with a steel inner ring are typically used for static or fatigue applications. For more information, refer to *Metal-to-metal Spherical plain bearings – Dynamic load rating* **page 135**.
- 7 Choose all other options, including *Lubrication* **page 288** and *Sealing solutions* **page 290**.

If the standard SKF range of integrated metal-to-metal spherical plain bearing rod ends does not meet your specific needs, refer to the inserted *Metal-to-metal spherical plain bearing rod end* **chapter page 288** or contact SKF for a customized design solution as described in *Customized product* **page 295**.

Figure 3

Integrated metal-to-metal spherical plain bearing rod end



Figure 4

Inserted metal-to-metal spherical plain bearing rod end



## Inserted bearing

If you are looking for a known rod end, or if you are an experienced rod end and bearing expert, use **table 1** and **2** to find the relevant product table.

For help in selecting the appropriate rod end size and options, follow these steps:

- 1 Select external or internal thread type depending on the design of the application attachment point, refer to **page 293**.
- 2 Use the metal-to-metal spherical plain bearing selection process **page 134** to select the most suitable bearing series and size required for the application.
- 3 Find the appropriate rod end series that uses the selected metal-to-metal bearing.
- 4 To select the rod end, confirm that the rod end load carrying capability is suitable for the application requirements. For more information, refer to *Rod end body load carrying capability* **page 292**.

- 5 If the rod end body's load carrying capability does not meet requirements, it is necessary to increase the bearing size and repeat the above steps.
- 6 Select all other options, including *Lubrication* **page 288**, *Materials* **page 289** and *Surface treatments* **page 290**.

If the standard SKF range of inserted metal-to-metal spherical plain bearing rod ends does not meet your specific needs, refer to the *Integrated metal-to-metal spherical plain bearing rod end* **chapter page 287** or contact SKF for a customized design solution as described in the *Customized products* **page 295**.

## Lubrication

Metal-to-metal spherical plain bearing rod ends are supplied greased and ready to be put into operation.

They can be:

- Greased-for-life
  - This is especially suitable for static and fatigue loading conditions.
- Relubricated periodically
  - This is especially suitable for dynamic loading conditions such as endurance. To facilitate this operation, lubrication holes and grooves can be provided in the inner ring and/or in the outer ring and rod end body. Refer to *Lubrication grooves* **page 289**. For optimum bearing performance, relubrication should be performed frequently, for instance during planned aircraft maintenance.

Lubrication helps to:

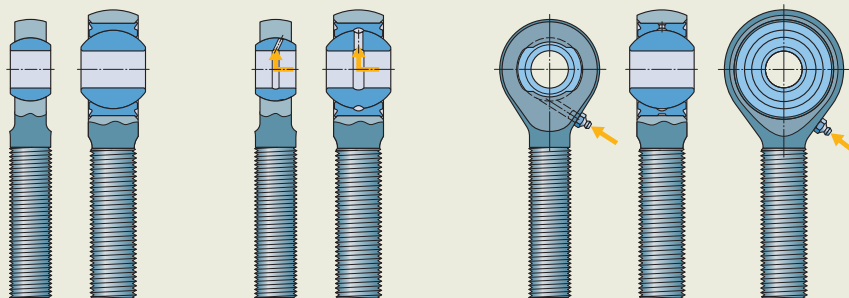
- Reduce friction
- Reduce wear rate
- Reduce seizing risk
- Extend bearing service life
- Protect against corrosion
- Expel contaminants and wear debris

Table 5

| Standard greases |                      |                                   |
|------------------|----------------------|-----------------------------------|
| NATO codes       | Standard             | Operating temperature             |
| G354             | MIL PRF 23827 type I | –73 to +121 °C<br>–100 to +250 °F |
| G395             | MIL PRF 81322        | –54 to +177 °C<br>–64 to +350 °F  |

Figure 5

### Lubrication grooves



No code: Without lubrication groove

With system S:  
Lubrication by  
inner ring

With system C:  
Lubrication by  
rod end body

## Lubricants

The greases used for standard metal-to-metal spherical plain bearing rod ends are listed in **table 5**.

Lubrication is primarily chosen according to the operating temperature.

**WARNING:** To prevent risk of bearing failure, use the same lubricant as supplied when relubricating.

## Lubrication grooves

To facilitate lubricant supply to the sliding surfaces, metal-to-metal spherical plain bearing rod ends requiring periodic relubrication are available with relubrication grooves and holes in either the inner ring, the outer ring and rod end body, or both (**figure 5**). Available options are given in the relevant product tables.

Selection should be made according to the grease input locations:

- For grease inputs in the rod end head via a grease fitting, select code C. Standard grease fittings can be used such as AS 15001.
- For grease inputs in the shaft, select code S

## Internal clearance

Inserted bearings are mounted and staked into the rod end body.

The staking can have an impact on the metal-to-metal spherical plain bearing clearance.

Internal clearances for the rod end assembly are listed in the relevant product tables.

For more information about metal-to-metal spherical plain bearing internal clearances, refer to *Internal clearance* **page 136**.

## Operating temperature

The permissible operating temperature of standard metal-to-metal spherical plain bearing rod ends is limited by the grease capability, **table 5**.

For operation outside this temperature range, standard rod end and bearing life and performance may be reduced. Contact SKF for more information.

A wider operating temperature range can be achieved by using customized solutions (*Customized products* **page 295**).

## Rod end data

### Material

As specified in *Metal-to-metal spherical plain bearing – Material* **page 138**, inserted and integrated metal-to-metal spherical plain bearings are available in the following materials:

- Bearing steel for high strength
- Corrosion-resistant steel for high strength and good corrosion resistance
- Copper alloys for good corrosion resistance and enhanced dynamic performance (For more information, refer to *Metal-to-metal Spherical plain bearings – Dynamic load rating* **page 135**)

The material of the rod end body is listed in the relevant product tables.

The typical material grades used by SKF metal-to-metal spherical plain bearing rod ends are listed in **table 6**.

Masses listed in the product tables are for rod ends made of steel materials. Titanium alloy is typically used for lightweight applications. With titanium alloy, the rod end body masses can be reduced by typically 55%.

Other materials are available on request. Refer to *Customized products* **page 295**.

Table 6

### Standard materials for metal-to-metal spherical plain bearing rod end bodies

| Rod end bearing type    | Material type             | Hardness HRC            | Rm MPa      | Corrosion resistance | Material designation | EN               | AMS      | Equivalent designation |
|-------------------------|---------------------------|-------------------------|-------------|----------------------|----------------------|------------------|----------|------------------------|
| Inserted and integrated | Alloy steel               | No standard requirement | ≥ 1080      | Moderate             | 30NCD16              | EN 2137, EN 2475 | –        | S97                    |
|                         | Corrosion resistant steel | 35 to 42                | ≥ 1080      | Good                 | 17-4PH H1025         | EN 2539, EN 3161 | AMS 5643 | Z6CNU17.04 H1025       |
| Inserted                | Titanium alloy            | No standard requirement | 900 to 1160 | Very good            | Ti6Al4V              | EN 3311          | AMS 4928 | TA6V                   |

## Surface treatments

Rod ends can be exposed to various environmental conditions including humidity, heat and fluids. These can limit the bearing life or performance by increasing the risk of contamination and corrosion.

Therefore, SKF provides surface treatments for increased general corrosion resistance and increased fretting resistance.

The rod end body surface treatments are listed in the relevant product tables.

Alloy steel rod ends are cadmium plated<sup>1)</sup> or zinc-nickel plated.

Titanium rod ends are anodized as standard.

Inserted metal-to-metal spherical plain bearings can be protected as specified in *Metal-to-metal spherical plain bearing – Surface treatments* **page 139**.

Cadmium plating<sup>1)</sup> is applied in accordance with AMS-QQ-P-416 or AMS03-19<sup>2)</sup>.

Zinc-nickel plating is applied in accordance with AMS 2417.

Anodizing is applied in accordance with MIL-A-8625.

<sup>1)</sup> Treatment includes chromium 6 compounds and may be subject to environmental legislation.

<sup>2)</sup> Formerly DEF STAN 03-19

Rod end interface dimensions and tolerances from product tables are not modified when surface treatments are used.

For other surface treatments for specific purposes, refer to *Customized products* **page 295** and contact SKF.

## Sealing solutions

Rod ends with inserted metal-to-metal spherical plain bearings can be supplied with shielding or sealing solutions as a protection against environmental conditions. For the design of the seal and shield, refer to *Spherical plain bearing – Sealing and shielding* **page 140**.

SKF also supplies special sealing solutions for integrated rod ends operating under specific application conditions. Refer to *Customized products* **page 295**.

Figure 6

Self-lubricating spherical plain bearing rod end





# Self-lubricating spherical plain bearing rod ends

## Design

Self-lubricating rod ends consist of a self-lubricating spherical plain bearing inserted into a rod end body.

## Selecting rod end size and options

If you are looking for a known rod end, according to its standard for example, or if you are an experienced rod end and bearing expert, use **table 1** and **2 page 283** to find the relevant product table.

For help in selecting the appropriate rod end size and options, follow these steps:

- 1 Select external or internal thread type depending on the design of the application attachment point, refer to **page 293**.
- 2 Use the self-lubricating spherical plain bearing selection process **page 142** to select the most suitable self-lubricating bearing series and size required for the application.
- 3 Find the appropriate rod end series that uses the selected self-lubricating bearing.

4 To select the rod end, confirm that the rod end load carrying capability is suitable for the application requirements. Refer to *Rod end body* **page 292**.

5 If the rod end body's load carrying capability does not meet requirements, it is necessary to increase the bearing size and repeat the above steps.

If the standard SKF range of self-lubricating spherical plain bearing rod ends does not meet your specific needs, contact SKF for a customized design solution, as described in the *Customized products* **page 295**.

## Friction and torque

Inserted self-lubricating spherical plain bearings are mounted and staked into the rod end body.

The staking can have an impact on the self-lubricating spherical plain bearing torque. The resulting torque is listed in the relevant product tables.

**WARNING:** Self-lubricating spherical plain bearing rod ends must not be lubricated. This may result in damage to the liner and reduced rod end and bearing performance.

## Operating temperature

The SKF self-lubricating rod ends have the same operating temperature range as the self-lubricating spherical plain bearing they incorporate.

Refer to *Spherical plain bearing – Operating temperature* **page 147**.

## Rod end data

### Material

Self-lubricating plain bearing materials are as specified in *Self-lubricating spherical plain bearing – Material* **page 148**:

Inner ring in corrosion-resistant steel 440C or PH13.8 and outer ring in corrosion-resistant-steel 17-4PH.

The material of the rod end body is given in the relevant product tables.

The typical material grades used by SKF self-lubricating spherical plain bearing rod ends are listed in **table 7**.

Masses listed in the product tables are for rod ends made of steel materials. Titanium alloy is typically used for lightweight applications. With titanium alloy, the rod end body masses can be reduced by typically 55%.

Other materials are available on request. Refer to *Customized products* **page 295**.

Table 7

### Standard materials for self-lubricating spherical plain bearing rod end bodies

| Material type             | Hardness HRC                                                          | Rm MPa                  | Corrosion resistance | Material designation | EN                  | AMS                     | Equivalent designation |
|---------------------------|-----------------------------------------------------------------------|-------------------------|----------------------|----------------------|---------------------|-------------------------|------------------------|
| Alloy steel               | For EN series = 33 to 39                                              | ≥ 1080                  | Moderate             | 30NCD16              | EN 2137/<br>EN 2475 | –                       | S97                    |
|                           | For AS series = 39 to 42<br>For other series, no standard requirement | ≥ 1080                  | Moderate             | 4340                 | –                   | AMS 6415,<br>AMS-S-5000 | 40NCD7                 |
| Corrosion-resistant steel | 35 to 42                                                              | ≥ 1080                  | Good                 | 17-4PH H1025         | EN 2539/<br>EN 3161 | AMS 5643                | Z6CNU17.04<br>H1025    |
|                           | 40 to 44                                                              | No standard requirement | Good                 | PH13.8 H1050         | –                   | AMS 5629                | –                      |
| Titanium alloy            | No standard requirement                                               | 900 to 1160             | Very good            | Ti6Al4V              | EN 3311             | AMS 4928                | TA6V                   |

## Surface treatments

Rod ends can be exposed to various environmental conditions including humidity, heat and fluids. These can limit the bearing life or performance by increasing the risk of contamination and corrosion.

Therefore, SKF provides surface treatments for increased general corrosion resistance and increased fretting resistance.

The rod end body surface treatments are listed in the relevant product tables.

Alloy steel rod ends are cadmium plated<sup>1)</sup> or zinc-nickel plated.

Titanium rod ends are anodized as standard.

Corrosion-resistant steel rod ends can be passivated, as required by the relevant standards.

Passivation is applied in accordance with AMS 2700.

Cadmium plating<sup>1)</sup> is applied in accordance with AMS-QQ-P-416 or AMS03-19<sup>2)</sup>.

Zinc-nickel plating is applied in accordance with AMS 2417.

Self-lubricating spherical plain bearings can be protected as specified in *Self-lubricating spherical plain bearing – Surface treatment* **page 149**.

Rod end interface dimensions and tolerances from product tables are not modified when surface treatments are used.

For other surface treatments for specific purposes, refer to *Customized products* **page 295** and contact SKF.

<sup>1)</sup> Treatment includes chromium 6 compounds and may be subject to environmental legislation.

<sup>2)</sup> Formerly DEF STAN 03-19

## Sealing solutions

Rod ends with self-lubricating inserted spherical plain bearings can be supplied with shielding or sealing solutions as a protection against environmental conditions. For the design of the seal and shield, refer to the *Spherical plain bearing*, **chapter 2**.

### Lined bore

SKF can supply self-lubricating rod ends with a self-lubricating liner in the bore. This is suitable for applications requiring axial movements along the shaft or when a secondary rotational motion in the bore is needed.

The considerations from *Spherical plain bearing – Lined Bore* **page 150**, are applicable.

## Rod end bodies

### Rod end body load carrying capability

#### Static load

The radial and axial static limit loads are listed in the relevant product tables for ball bearing rod ends.

The radial ultimate loads are listed in the relevant product tables for spherical plain bearing rod ends.

These values are valid for rod end bodies made of alloy steel or corrosion resistant steel.

For titanium rod end bodies, radial static ultimate loads are 70% of the equivalent steel rod end.

#### Dynamic load for rod ends with inserted bearings

Rod ends can support fatigue and endurance dynamic loading.

- Fatigue dynamic loading is when the load is alternating with no imposed swivelling or rotational movement.
- Endurance dynamic loading is when the load is applied constantly or alternating with swivelling and/or rotational movement. For rod ends with inserted bearings, it is the bearing that undergoes movement and withstands the endurance loading. The rod end itself only has to withstand a fatigue loading condition.

SKF standard rod ends are tested in fatigue dynamic loading conditions at a stress ratio,  $R = 0,1$ , see **diagram 1**.  $R$  is the ratio of the minimum applied load and the maximum applied load.

$$R = \frac{P_{\min}}{P_{\max}} = 0,1$$

Where:

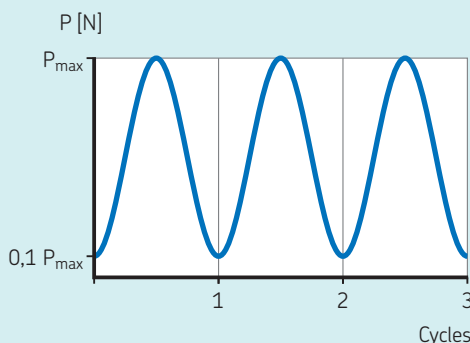
$R$  = Stress ratio

$P_{\max}$  = Fatigue load carrying capability listed in the relevant product table [kN/lbf]

$P_{\min}$  = 10% of the fatigue load carrying capability [kN/lbf]

Diagram 1

#### Fatigue load



AS 81935<sup>3)</sup> bearings are tested up to 50 000 load cycles. Other standard rod ends are tested up to  $10^6$  cycles.

**NOTE:** For a given bearing type, rod ends with integrated bearings typically show better dynamic performance than the same size rod ends with inserted bearings. Contact SKF for more information.

<sup>3)</sup> Bearings, plain, rod end, self-aligning, self-lubricating, general specification for  $-54$  to  $163$  °C ( $-65$  to  $+325$  °F)

## Rod end head shape

Rod ends can have different head shapes in accordance with the relevant standard requirements (**figure 7**).

See the rod end head shape of each series in the relevant product tables.

For specific rod end head shapes, other than the ones specified in the product tables, refer to *Customized products* **page 295** and contact SKF.

## Rod end body features

### Thread type

SKF provides external or internal threads on rod end bodies (**figure 8**).

Rod end bodies with external thread have a rolled external thread to be screwed into a threaded housing.

Rod end bodies with internal thread have an internal thread to be mounted on a threaded shaft.

Threads are defined in accordance with international standards. External threads are rolled.

SKF supplies right-hand or left-hand threads. See the relevant product tables.

### Groove and keyway

A locating groove is a horizontal groove in the shank used to indicate the minimum insertion length for the rod end. This enables correct rod end positioning and ensures that the thread is fully supported and that the rod end can sustain its full loading capacity.

A keyway is a vertical groove that can be used for rod end orientation or as an anti-rotation slot for tab washers.

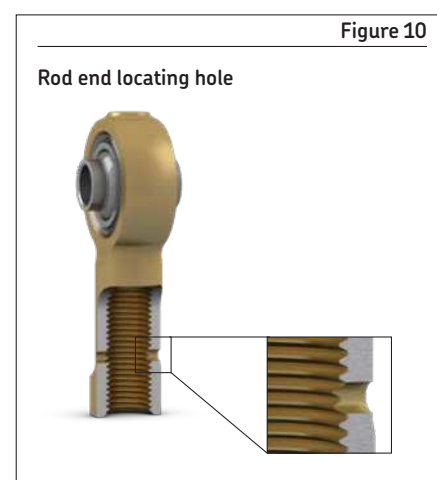
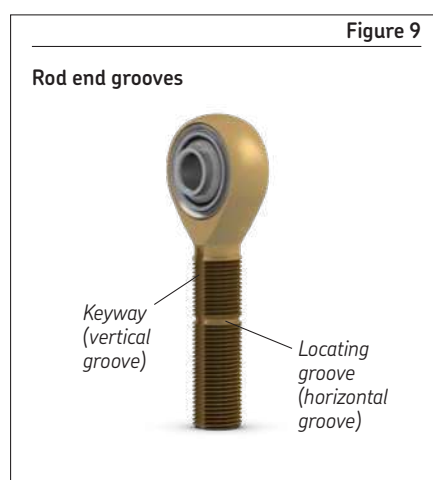
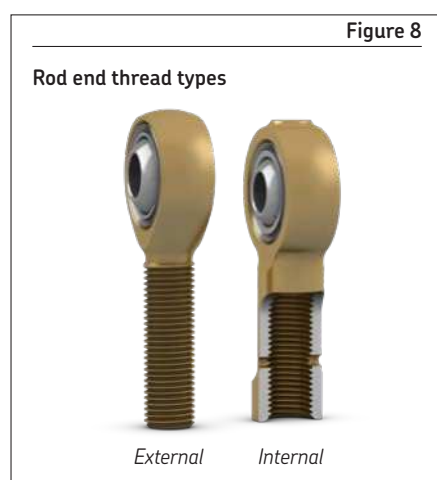
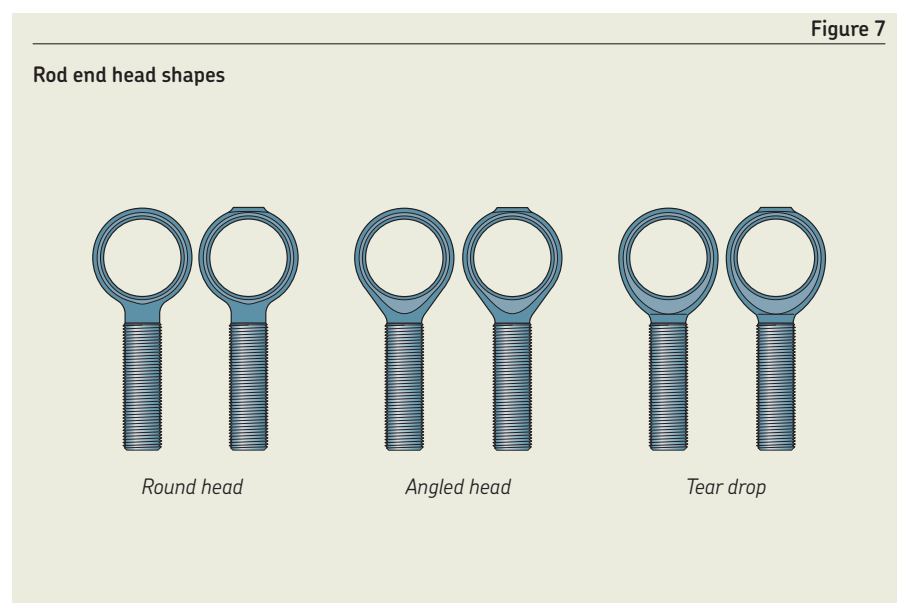
See **figure 9**.

In presence of a locating groove, both the locating groove and keyway (if present) are painted in red.

### Locating locking hole

A hole can be integrated into the rod ends with internal thread to:

- Ensure the locking of the rod end by inserting a pin and prevent unscrewing
- Check that the insertion length for the rod end is above the minimum limit. See **figure 10**



# Bearing handling

## Mounting

Rod ends are fitted on pins and shafts in the same way as the bearing type they use. Refer to the relevant *Mounting section* **page 49** for rolling bearings and **page 153** for spherical plain bearings.

When attaching rod ends to threaded rods or extension tubes (**figure 11**), it is important to ensure that the insertion length is sufficient. When rod ends have a locating groove, ensure to screw the rod end in until the groove is covered.

Use a counter locking nut or a tab washer to retain the rod end.

These should be used on the external thread (rod or rod end body) and should be securely tightened against the abutment surface on the rod end or tube.

## Dismounting

### Rod end dismounting

To dismount rod ends, loosen the lock nut securing the shank and, if possible, unscrew the rod end from its rod or tube. Then remove the rod end from the pin or shaft the same way as for a bearing. Refer to the relevant *Dismounting section* **page 50** for rolling bearings and **page 155** for spherical plain bearings.

### Bearing dismounting from rod end

It is not recommended to remove the bearing from the rod end body. If the bearing becomes damaged, or reaches its wear limit, it is necessary to replace the rod end assembly.

## Storage

The performance of rod ends, bearings, seals and lubricants can be impacted by the rod end and bearing storage conditions and time in inventory. SKF recommends a “first in, first out” inventory policy and that the rod ends and bearings are stored under the storage conditions and storage time specified below.

### Storage conditions

To maintain the integrity of the product during storage, SKF recommends the following basic housekeeping practices:

- Store rod ends in a stable, clean, vibration-free, and dry area with a cool and steady temperature. See temperature limits in **table 8**
- Control and limit relative humidity of the storage area, see limits in **table 8**
- Keep rod ends in their original individual unopened packages until immediately prior to mounting in application in order to prevent risk of bearing deterioration such as corrosion or the ingress of contaminants.

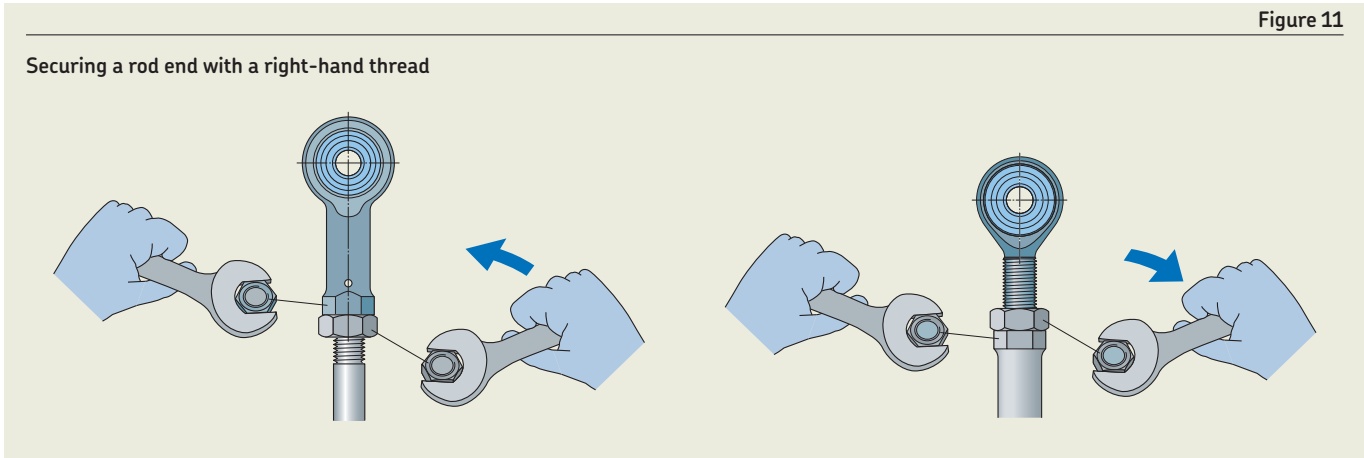
Beyond the limit storage time for metal-to-metal spherical plain bearings and ball bearings, the ageing of grease and degradation of grease properties can lead to a reduction of bearing performance. Therefore, after five years of storage, the grease in the bearings must be replaced by SKF.

For storage outside these conditions, the stated storage life is not guaranteed. Contact SKF for more information.

Table 8

| Storage life        | Ball bearing rod end         | Metal-to-metal rod end       | Self-lubricating rod end     |
|---------------------|------------------------------|------------------------------|------------------------------|
| Storage life        | 5 years                      | 5 years                      | 15 years <sup>1)</sup>       |
| Storage temperature | 15 to 35 °C<br>(59 to 95 °F) | 15 to 35 °C<br>(59 to 95 °F) | 15 to 25 °C<br>(59 to 77 °F) |
| Relative humidity   | 50 to 70%                    | 50 to 70%                    | 50 to 70%                    |

<sup>1)</sup> Can be limited by specific combinations of surface treatment and marking technology. Always refer to the dates indicated on SKF's packaging. Contact SKF for more information



# Customized products

SKF designs and manufactures customized rod ends to meet specific application requirements.

Examples can include, but are not limited to:

- **Specific geometries and dimensions**
- **Materials, including:**
  - Alternative steel alloys and corrosion-resistant steel
  - Titanium alloys
- **Surface treatments**, including chemical passivation, cadmium plating or zinc-nickel plating. Certain treatments include chromium 6 compounds and may be subject to environmental legislation
- **Lubricants** as specified in the rolling bearing and metal-to-metal spherical plain bearing sections or **liners** as specified in the spherical plain bearing section
- **Greasing solutions** as specified in the rolling bearing and metal-to-metal spherical plain bearing sections
- **Sealing solutions** as specified in the relevant product sections

## Legacy products

The legacy series listed in **table 9** are delivered and marked according to the listed cross-reference designation system (see also the relevant product tables).

## Legacy standards

SKF can supply bearings compliant to the following legacy standards :

– EN 4351

### Function Typical SKF customized solutions

#### Rod end head and shank shapes



*Including alternative head shapes (round, angled, tear drop ...), bump stops, locking features or angle between shank and head ...*

#### Geometries and designs



*Split metal-to-metal bearing inner ring rod ends*

*Double ended links*

*Inserted rolling bearing rod ends*

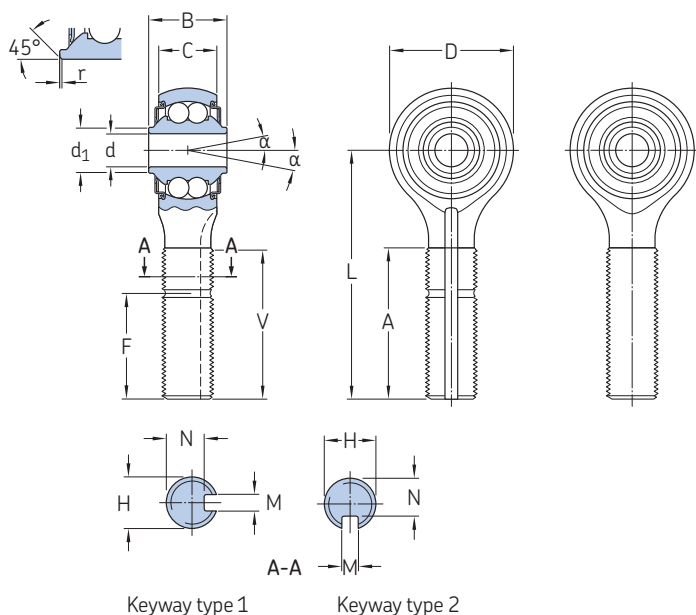
**Table 9**

### Cross-reference to legacy products

| Variant                                      | Cross-reference designation system | SKF Aerospace France designation system<br>Lons-le-Saunier (formerly known as SARMA) | SKF Aerospace U.K. Limited designation system<br>Clevedon (formerly known as AMPEP) |
|----------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Wide inch external thread                    | MJ/WAS..                           | UMJ/XRL..                                                                            | 12BM..                                                                              |
| Narrow inch external thread                  | MJ/NAS..                           | UMJ/XRE..                                                                            | 12BNM..                                                                             |
| Wide inch external thread with PH13.8 body   | PHMJ/WAS..                         | PHUMJ/XRL..                                                                          | 12CM..                                                                              |
| Narrow inch external thread with PH13.8 body | PHMJ/NAS..                         | PHUMJ/XRE..                                                                          | 12CNM..                                                                             |
| Wide inch internal thread                    | FJ/WAS..                           | UFJ/XRL..                                                                            | 12BF..                                                                              |
| Narrow inch internal thread                  | FJ/NAS..                           | UFJ/XRE..                                                                            | 12BNF..                                                                             |
| Wide inch internal thread with PH13.8 body   | PHFJ/WAS..                         | PHUFJ/XRL..                                                                          | 12CF..                                                                              |
| Narrow inch internal thread with PH13.8 body | PHFJ/NAS..                         | PHUFJ/XRE..                                                                          | 12CNF..                                                                             |

### 3.1 External thread rod end with integrated rolling bearing (metric dimensions)

C..MJ, CN..MJ



|                         |                                                   |
|-------------------------|---------------------------------------------------|
| Technical specification | EN 2067                                           |
| Product standard        | EN 3541<br>(bearing in bearing steel)             |
|                         | EN 4036 (bearing in<br>corrosion-resistant steel) |

#### Dimensions

| Nominal bore code | Dimensions<br>d<br>0/-0,008 | D<br>+0,2/0 | B<br>0/-0,12 | C<br>+0,1/0 | A<br>Min | V<br>+0,5/0 | d <sub>1</sub><br>≈ | H<br>4h 6h  | L<br>±0,5 | F<br>Min | M<br>+0,1/0 | N<br>0/-0,1 |
|-------------------|-----------------------------|-------------|--------------|-------------|----------|-------------|---------------------|-------------|-----------|----------|-------------|-------------|
| –                 | mm                          |             |              |             |          |             |                     | –           | mm        |          |             |             |
| <b>5</b>          | 5                           | 20,5        | 12           | 8,5         | 33       | 33          | 7,6                 | MJ8 × 1     | 48        | 18       | 1,6         | 6,6         |
| <b>N 6</b>        | 6                           | 22,5        | 14           | 10          | 37       | 37          | 8,6                 | MJ10 × 1,25 | 54        | 23       | 2,4         | 8,0         |
| <b>N 8</b>        | 8                           | 28,5        | 15           | 10          | 42       | 42          | 11,1                | MJ12 × 1,25 | 62        | 27       | 2,4         | 10,2        |
| <b>N10</b>        | 10                          | 32          | 20           | 14          | 48       | 48          | 13,6                | MJ14 × 1,5  | 73        | 31       | 3,2         | 12,2        |

#### Dimensions cont., loads, torque and clearance

| Nominal bore code | Dimensions     |   | Mass<br>≈ | Limit static loads       |                         | Max. starting torque |        | Max. swivel-<br>ling torque | Max. axial<br>clearance | Radial clearance                                      |                                                  |
|-------------------|----------------|---|-----------|--------------------------|-------------------------|----------------------|--------|-----------------------------|-------------------------|-------------------------------------------------------|--------------------------------------------------|
|                   | r<br>+0,3/−0,2 | α |           | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | Shielded             | Sealed |                             |                         | EN 4036<br>(bearing in corrosion-<br>resistant steel) | EN 3541<br>(bearing in bearing<br>steel) Maximum |
| –                 | mm             | ° | g         | kN                       |                         | mNm                  |        |                             | μm                      |                                                       |                                                  |
| 5                 | 0,5            | 8 | 35        | 4,7                      | 1,5                     | 1                    | 2      | 150                         | 80                      | 1/5                                                   | 20                                               |
| N 6               | 0,5            | 8 | 60        | 6,8                      | 2,11                    | 2                    | 4      | 150                         | 80                      | 1/5                                                   | 20                                               |
| N 8               | 0,5            | 8 | 85        | 8,9                      | 2,8                     | 5                    | 10     | 200                         | 80                      | 1/5                                                   | 20                                               |
| N10               | 0,5            | 8 | 130       | 14                       | 4,4                     | 7                    | 12     | 200                         | 80                      | 1/5                                                   | 20                                               |



## Designation system

Example: ZXCN 6MJEGRKN811  
WC 5MJN741

ZX CN 6 MJ E G R K N811

### Material and surface treatment

|                   | Inner ring and balls      | Rod end body                                 |
|-------------------|---------------------------|----------------------------------------------|
| No code           | Bearing steel             | Cadmium plated steel                         |
| S <sup>1)</sup>   | Bearing steel             | Zinc-nickel plated steel                     |
| W <sup>1)</sup>   | Corrosion-resistant steel | Cadmium plated steel                         |
| SW <sup>1)</sup>  | Corrosion-resistant steel | Zinc-nickel plated steel                     |
| X                 | Corrosion-resistant steel | Corrosion-resistant steel                    |
| ZX <sup>1)</sup>  | Corrosion-resistant steel | Cadmium plated corrosion-resistant steel     |
| SZX <sup>1)</sup> | Corrosion-resistant steel | Zinc-nickel plated corrosion-resistant steel |

### Basic designation

#### Bore code

#### Shield and seal

|         |          |
|---------|----------|
| No code | Shielded |
| E       | Sealed   |

#### Thread direction

|         |                   |
|---------|-------------------|
| No code | Right-hand thread |
| G       | Left-hand thread  |

#### Locating groove

|         |                                       |
|---------|---------------------------------------|
| No code | Without locating groove <sup>1)</sup> |
| R       | With locating groove                  |

#### Keyway

|                  |                    |
|------------------|--------------------|
| No code          | Without keyway     |
| K                | With keyway type 1 |
| K2 <sup>2)</sup> | With keyway type 2 |

#### Lubricant

|      |             |
|------|-------------|
| N741 | Grease G354 |
| N811 | Grease G395 |

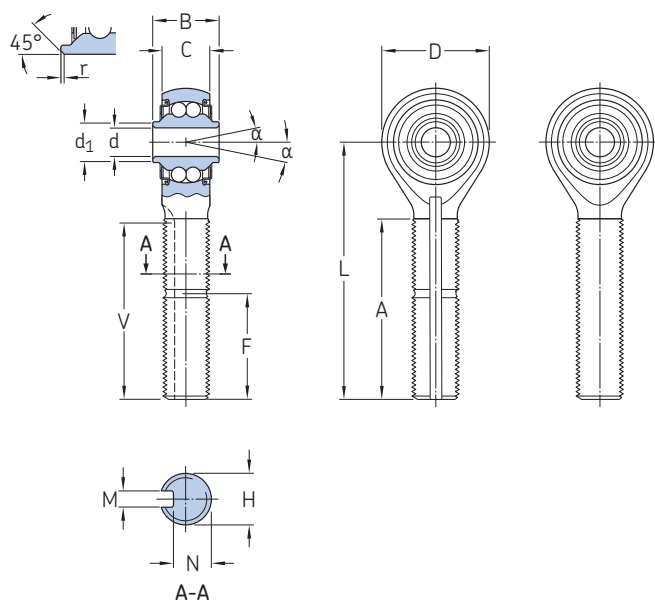
<sup>1)</sup> SKF option

<sup>2)</sup> SKF option for bearing in bearing steel

### 3.2 External thread rod end with integrated rolling bearing (metric dimensions)

C..M, CN..M, CN..M..SP1

Technical specification –  
Product standard –



#### Dimensions

| Nominal bore code | Dimensions<br>d<br>0/-0,008 | D<br>+0,2/0 | B<br>0/-0,12 | C<br>+0,1/0 | A<br>Min | V<br>+0,5/0 | d <sub>1</sub><br>≈ | H<br>4h   | L<br>±0,5 | F<br>Min | M<br>+0,1/0 | N<br>0/-0,1 |
|-------------------|-----------------------------|-------------|--------------|-------------|----------|-------------|---------------------|-----------|-----------|----------|-------------|-------------|
| –                 | mm                          |             |              |             |          |             |                     | –         | mm        |          |             |             |
| <b>5</b>          | 5                           | 20,5        | 12           | 8,5         | 33       | 33          | 7,6                 | M8 × 1    | 48        | 18       | 1,6         | 6,6         |
| <b>N 6</b>        | 6                           | 22,5        | 14           | 10          | 37       | 37          | 8,6                 | M10 × 1   | 54        | 22       | 2,4         | 8           |
| <b>N 8</b>        | 8                           | 28,5        | 15           | 10          | 42       | 42          | 11,1                | M12 × 1   | 62        | 25       | 2,4         | 10,2        |
| <b>N 8..SP1</b>   | 8                           | 28,5        | 15           | 10          | 42       | 42          | 11,1                | M12 × 1,5 | 62        | 25       | 2,4         | 10,2        |
| <b>N10</b>        | 10                          | 32          | 20           | 14          | 48       | 48          | 13,6                | M14 × 1,5 | 73        | 31       | 3,2         | 12,2        |
| <b>N10..SP1</b>   | 10                          | 32          | 20           | 14          | 48       | 48          | 13,6                | M14 × 1   | 73        | 31       | 3,2         | 12,2        |

#### Dimensions cont, loads, torque and clearance

| Nominal bore code | Dimensions<br>r<br>+0,3/-0,2 | α | Mass<br>≈ | Static limit loads<br>Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | Max. starting torque<br>Shielded | Max. starting torque<br>Sealed | Max. swivelling torque | Max. axial clearance |
|-------------------|------------------------------|---|-----------|------------------------------------------------|-------------------------|----------------------------------|--------------------------------|------------------------|----------------------|
| –                 | mm                           | ° | g         | kN                                             |                         | mNm                              |                                |                        | μm                   |
| <b>5</b>          | 0,5                          | 8 | 35        | 4,7                                            | 1,5                     | 1                                | 2                              | 150                    | 80                   |
| <b>N 6</b>        | 0,5                          | 8 | 50        | 6,8                                            | 2,1                     | 2                                | 4                              | 150                    | 80                   |
| <b>N 8</b>        | 0,5                          | 8 | 80        | 8,9                                            | 2,8                     | 5                                | 10                             | 200                    | 80                   |
| <b>N 8..SP1</b>   | 0,5                          | 8 | 80        | 8,9                                            | 2,8                     | 5                                | 10                             | 200                    | 80                   |
| <b>N10</b>        | 0,5                          | 8 | 130       | 14                                             | 4,4                     | 7                                | 12                             | 200                    | 80                   |
| <b>N10..SP1</b>   | 0,5                          | 8 | 130       | 14                                             | 4,4                     | 7                                | 12                             | 200                    | 80                   |





## Designation system

Example: ZXCN 8MESP1GRKG81  
C 5M

ZX CN 8 M E SP1 G R K G81

### Material and surface treatment

#### Inner ring and balls

**No code** Bearing steel  
**S** Bearing steel  
**W** Corrosion-resistant steel  
**SW** Corrosion-resistant steel  
**X** Corrosion-resistant steel  
**ZX** Corrosion-resistant steel  
**SZX** Corrosion-resistant steel

#### Rod end body

Cadmium plated steel  
Zinc-nickel plated steel  
Cadmium plated steel  
Zinc-nickel plated steel  
Corrosion-resistant steel  
Cadmium plated corrosion-resistant steel  
Zinc-nickel plated corrosion-resistant steel

### Basic designation

#### Bore code

#### Shield and seal

**No code** Shielded  
**E** Sealed

#### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

#### Locating groove

**No code** Without locating groove  
**R** With locating groove

#### Keyway

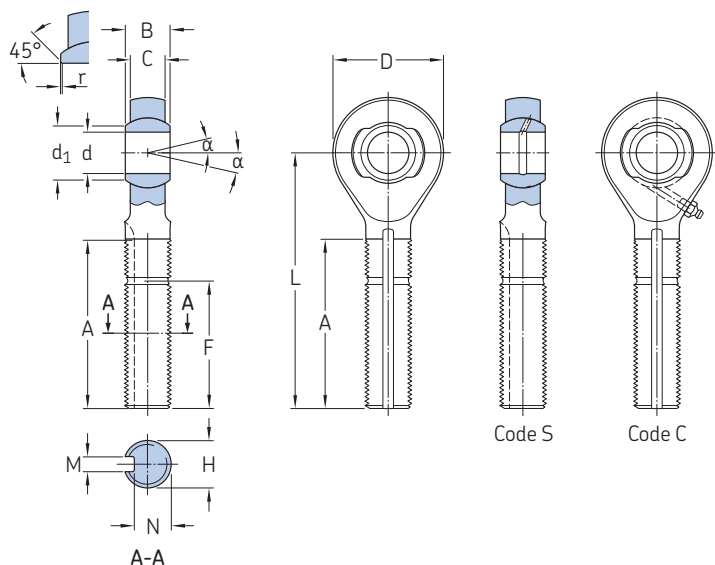
**No code** Without keyway  
**K** With keyway

#### Lubricant

**No code** Grease G354  
**G81** Grease G395

### 3.3 External thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions)

EM..



Technical specification –  
Product standard –

#### Dimensions

| Nominal bore code | Dimensions d | Tolerances $\Delta d_{mp}$ | D  | B  | C    | A   | V      | H MJ 4h 6h | L   | d <sub>1</sub> |
|-------------------|--------------|----------------------------|----|----|------|-----|--------|------------|-----|----------------|
| –                 | mm           | $\mu m$                    | mm |    |      | Min | +0,5/0 | –          | mm  | $\approx$      |
| 12                | 12           | 0/–8                       | 32 | 13 | 10   | 48  | 48     | 14 × 1,5   | 74  | 12,6           |
| 15                | 15           | 0/–8                       | 40 | 15 | 12   | 56  | 56     | 16 × 1,5   | 85  | 15,6           |
| 17                | 17           | 0/–8                       | 42 | 16 | 13,5 | 63  | 63     | 18 × 1,5   | 93  | 17,6           |
| 20                | 20           | 0/–9                       | 51 | 22 | 18   | 78  | 78     | 22 × 1,5   | 115 | 20,6           |
| 25                | 25           | 0/–9                       | 62 | 25 | 20   | 85  | 85     | 24 × 2     | 130 | 25,6           |
| 30                | 30           | 0/–9                       | 70 | 28 | 24   | 93  | 93     | 27 × 2     | 145 | 30,6           |
| 35                | 35           | 0/–11                      | 80 | 31 | 26   | 100 | 100    | 33 × 2     | 155 | 35,6           |
| 40                | 40           | 0/–11                      | 88 | 34 | 29   | 125 | 125    | 36 × 2     | 190 | 40,6           |

#### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions F Min | M +0,1/0 | N 0/–0,1 | r +0,3/0 | $\alpha$ | Mass $\approx$ | Ultimate radial load <sup>1)</sup> | Axial clearance EM | EMS/EMC |
|-------------------|------------------|----------|----------|----------|----------|----------------|------------------------------------|--------------------|---------|
| –                 | mm               |          |          |          | °        | g              | kN                                 | $\mu m$            |         |
| 12                | 37               | 3,2      | 12,2     | 0,1      | 10       | 120            | 65                                 | 5/25               | 15/40   |
| 15                | 43               | 3,2      | 13,7     | 0,1      | 8        | 200            | 95                                 | 5/25               | 15/40   |
| 17                | 48               | 3,2      | 15,8     | 0,1      | 7        | 250            | 120                                | 5/25               | 15/40   |
| 20                | 59               | 4        | 19,4     | 0,1      | 8        | 490            | 170                                | 10/30              | 20/45   |
| 25                | 65               | 4        | 21,4     | 0,1      | 8        | 720            | 210                                | 10/30              | 20/45   |
| 30                | 73               | 4,8      | 24,3     | 0,1      | 6        | 1 030          | 270                                | 10/30              | 20/45   |
| 35                | 89               | 4,8      | 30       | 0,1      | 7        | 1 540          | 400                                | 15/40              | 25/50   |
| 40                | 97               | 6,4      | 32,5     | 0,1      | 6        | 2 190          | 475                                | 15/40              | 25/50   |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292



## Designation system

Examples: XEMS20G-2  
EM12

X EM S 20 G -2

### Material and surface treatment

|         | Inner ring                | Rod end body              |
|---------|---------------------------|---------------------------|
| No code | Cadmium plated steel      | Cadmium plated steel      |
| S       | Zinc-nickel plated steel  | Zinc-nickel plated steel  |
| W       | Corrosion-resistant steel | Cadmium plated steel      |
| SW      | Corrosion-resistant steel | Zinc-nickel plated steel  |
| X       | Corrosion-resistant steel | Corrosion-resistant steel |
| Q       | Bronze beryllium          | Corrosion-resistant steel |

### Basic designation

#### Lubrication grooves

|         |                             |
|---------|-----------------------------|
| No code | Without lubrication groove  |
| S       | Lubrication by inner ring   |
| C       | Lubrication by rod end body |

#### Bore code

#### Thread direction

|         |                   |
|---------|-------------------|
| No code | Right-hand thread |
| G       | Left-hand thread  |

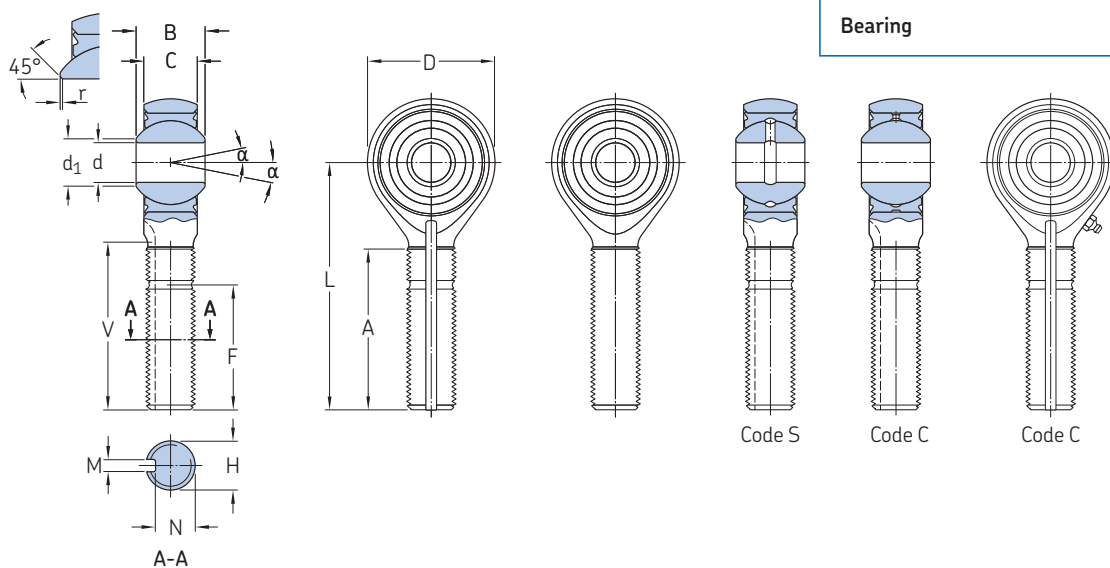
#### Lubricant

|         |             |
|---------|-------------|
| No code | Grease G354 |
| -2      | Grease G395 |

### 3.4 External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions)

EMJ/..ML

|                         |       |
|-------------------------|-------|
| Technical specification | –     |
| Product standard        | –     |
| Bearing                 | ML..R |



#### Dimensions

| Nominal bore code | Dimensions d | Tolerances Δdmp | D    | B    | C    | A   | V   | H MJ 4h 6h | L   | d <sub>1</sub> | F Min |
|-------------------|--------------|-----------------|------|------|------|-----|-----|------------|-----|----------------|-------|
| –                 | mm           | μm              | mm   | mm   | mm   | mm  | mm  | mm         | mm  | mm             | mm    |
| 5                 | 5            | 0/-8            | 21   | 11   | 8,7  | 28  | 28  | 8 × 1      | 46  | 7,7            | 18    |
| 6                 | 6            | 0/-8            | 22,5 | 11   | 8,7  | 37  | 37  | 10 × 1,25  | 54  | 7,7            | 22    |
| 8                 | 8            | 0/-8            | 26   | 11   | 8,2  | 42  | 42  | 12 × 1,25  | 62  | 10,3           | 25    |
| 10                | 10           | 0/-8            | 32   | 12,5 | 10,2 | 48  | 48  | 14 × 1,5   | 73  | 12,2           | 31    |
| 12                | 12           | 0/-8            | 37   | 16   | 13,2 | 56  | 56  | 16 × 1,5   | 85  | 15,5           | 34    |
| 15                | 15           | 0/-8            | 41,5 | 17   | 13,7 | 70  | 70  | 20 × 1,5   | 100 | 18,9           | 41    |
| 17                | 17           | 0/-8            | 43   | 18   | 14,7 | 78  | 78  | 22 × 1,5   | 107 | 20,1           | 46    |
| 20                | 20           | 0/-10           | 50   | 20   | 16,2 | 85  | 85  | 24 × 2     | 121 | 23,5           | 50    |
| 25                | 25           | 0/-10           | 77   | 32   | 26,2 | 100 | 100 | 33 × 2     | 154 | 35,3           | 65    |

#### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions M | Dimensions N | r   | α  | Mass ≈ | Radial load Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Axial clearance Standard | Reduced |
|-------------------|--------------|--------------|-----|----|--------|------------------------------------|--------------------------------|--------------------------|---------|
| –                 | mm           | mm           | mm  | °  | g      | kN                                 | mm                             | mm                       | mm      |
| 5                 | 1,6          | 6,6          | 0,1 | 15 | 40     | 30                                 | 5                              | 17/75                    | 35 max  |
| 6                 | 2,4          | 8            | 0,1 | 15 | 55     | 40                                 | 7,1                            | 17/75                    | 35 max  |
| 8                 | 2,4          | 10,2         | 0,1 | 14 | 75     | 50                                 | 8,6                            | 17/75                    | 35 max  |
| 10                | 3,2          | 12,2         | 0,1 | 10 | 125    | 90                                 | 14,8                           | 17/75                    | 35 max  |
| 12                | 3,2          | 13,7         | 0,1 | 10 | 195    | 110                                | 18,7                           | 17/75                    | 35 max  |
| 15                | 4            | 17,4         | 0,1 | 9  | 285    | 130                                | 22,3                           | 17/75                    | 35 max  |
| 17                | 4            | 19,4         | 0,1 | 9  | 340    | 150                                | 24,8                           | 20/80                    | 40 max  |
| 20                | 4            | 21,4         | 0,1 | 8  | 490    | 190                                | 31,6                           | 20/80                    | 40 max  |
| 25                | 4,8          | 30           | 0,1 | 9  | 1 590  | 475                                | 78,4                           | 25/100                   | 50 max  |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

## Designation system

Examples: XEMJ/WQMLS 6GRKX-2  
EMJ/WML20

### Rod end body material

**No code** Cadmium plated steel  
**S** Zinc-nickel plated steel  
**X** Corrosion-resistant steel  
**T<sup>1)</sup>** Anodized titanium

### Basic designation

#### Bearing material

|           | Inner ring                | Outer ring                |
|-----------|---------------------------|---------------------------|
| <b>W</b>  | Corrosion-resistant steel | Corrosion-resistant steel |
| <b>Q</b>  | Bronze beryllium          | Corrosion-resistant steel |
| <b>WQ</b> | Corrosion-resistant steel | Bronze aluminium          |

#### Lubrication grooves

**No code** Without lubrication groove  
**S** Lubrication by inner ring  
**C** Lubrication by rod end body

#### Bore code

#### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

#### Locating groove

**No code** Without locating groove  
**R** With locating groove

#### Keyway

**No code** Without keyway  
**K** With keyway

#### Internal clearance

**No code** Standard clearance  
**X** Reduced clearance

#### Lubricant

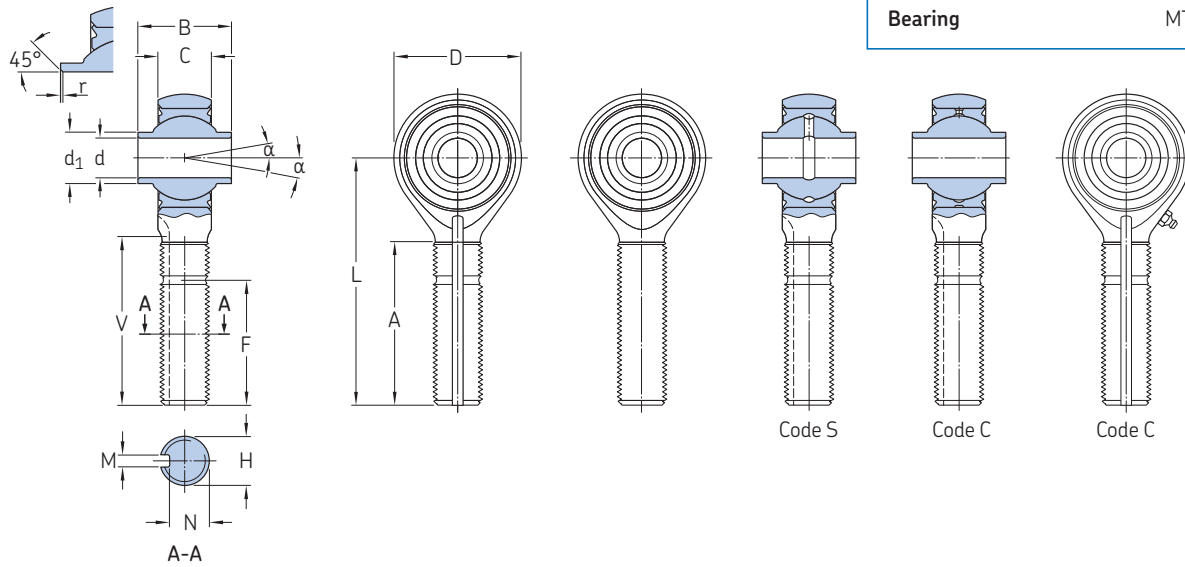
**No code** Grease G354  
**-2** Grease G395

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.5 External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions)

EMJ/..MT

|                         |       |
|-------------------------|-------|
| Technical specification | –     |
| Product standard        | –     |
| Bearing                 | MT..R |



#### Dimensions

| Nominal bore code | Dimensions d | Tolerances Δdmp | D  | B    | C    | A   | V   | H MJ 4h 6h | L   | d <sub>1</sub> | F Min |
|-------------------|--------------|-----------------|----|------|------|-----|-----|------------|-----|----------------|-------|
| –                 | mm           | μm              | mm | mm   | mm   | mm  | mm  | mm         | mm  | mm             | mm    |
| 5                 | 5            | 0/-8            | 19 | 12,5 | 5,2  | 28  | 28  | 8 × 1      | 45  | 7,8            | 18    |
| 6                 | 6            | 0/-8            | 25 | 15   | 6,2  | 37  | 37  | 10 × 1,25  | 58  | 9,6            | 22    |
| 8                 | 8            | 0/-8            | 35 | 21   | 9,2  | 42  | 42  | 12 × 1,25  | 71  | 13,3           | 25    |
| 10                | 10           | 0/-8            | 35 | 21,0 | 9,2  | 48  | 48  | 14 × 1,5   | 77  | 13,3           | 31    |
| 12                | 12           | 0/-8            | 42 | 24   | 10,2 | 56  | 56  | 16 × 1,5   | 89  | 17,7           | 34    |
| 17                | 17           | 0/-8            | 51 | 30   | 14,2 | 78  | 78  | 22 × 1,5   | 115 | 21,8           | 46    |
| 20                | 20           | 0/-10           | 58 | 33   | 16,2 | 85  | 85  | 24 × 2     | 128 | 24             | 50    |
| 22                | 22           | 0/-10           | 65 | 36   | 16,2 | 93  | 93  | 27 × 2     | 140 | 28,3           | 55    |
| 25                | 25           | 0/-10           | 77 | 48   | 21,2 | 100 | 100 | 33 × 2     | 154 | 32,2           | 65    |

#### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions M | Dimensions N | r   | α  | Mass ≈ | Radial loads Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Axial clearance Standard | Reduced |
|-------------------|--------------|--------------|-----|----|--------|-------------------------------------|--------------------------------|--------------------------|---------|
| –                 | mm           | mm           | mm  | °  | g      | kN                                  |                                | μm                       |         |
| 5                 | 1,6          | 6,6          | 0,1 | 15 | 30     | 21,2                                | 3,4                            | 17/75                    | 35 max  |
| 6                 | 2,4          | 8            | 0,1 | 24 | 55     | 30,6                                | 4,9                            | 17/75                    | 35 max  |
| 8                 | 2,4          | 10,2         | 0,1 | 20 | 115    | 76                                  | 12                             | 17/75                    | 35 max  |
| 10                | 3,2          | 12,2         | 0,1 | 20 | 135    | 76                                  | 12,2                           | 17/75                    | 35 max  |
| 12                | 3,2          | 13,7         | 0,1 | 20 | 225    | 102,1                               | 16,4                           | 17/75                    | 35 max  |
| 17                | 4            | 19,4         | 0,1 | 20 | 440    | 174,8                               | 28,3                           | 20/80                    | 40 max  |
| 20                | 4            | 21,4         | 0,1 | 19 | 610    | 240,1                               | 38,7                           | 20/80                    | 40 max  |
| 22                | 4,8          | 24,3         | 0,1 | 19 | 810    | 270,5                               | 43,4                           | 20/80                    | 40 max  |
| 25                | 4,8          | 30           | 0,1 | 21 | 1 460  | 401,3                               | 64,9                           | 25/100                   | 50 max  |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

## Designation system

Examples: XEMJ/WQMTS 6GRKX-2  
EMJ/WMT20

### Rod end body material

**No code** Cadmium plated steel  
**S** Zinc-nickel plated steel  
**X** Corrosion-resistant steel  
**T<sup>1)</sup>** Anodized titanium

### Basic designation

#### Bearing material

|           | Inner ring                | Outer ring                |
|-----------|---------------------------|---------------------------|
| <b>W</b>  | Corrosion-resistant steel | Corrosion-resistant steel |
| <b>Q</b>  | Bronze beryllium          | Corrosion-resistant steel |
| <b>WQ</b> | Corrosion-resistant steel | Bronze aluminium          |

#### Lubrication grooves

**No code** Without lubrication groove  
**S** Lubrication by inner ring  
**C** Lubrication by rod end body

#### Bore code

#### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

#### Locating groove

**No code** Without locating groove  
**R** With locating groove

#### Keyway

**No code** Without keyway  
**K** With keyway

#### Internal clearance

**No code** Standard clearance  
**X** Reduced clearance

#### Lubricant

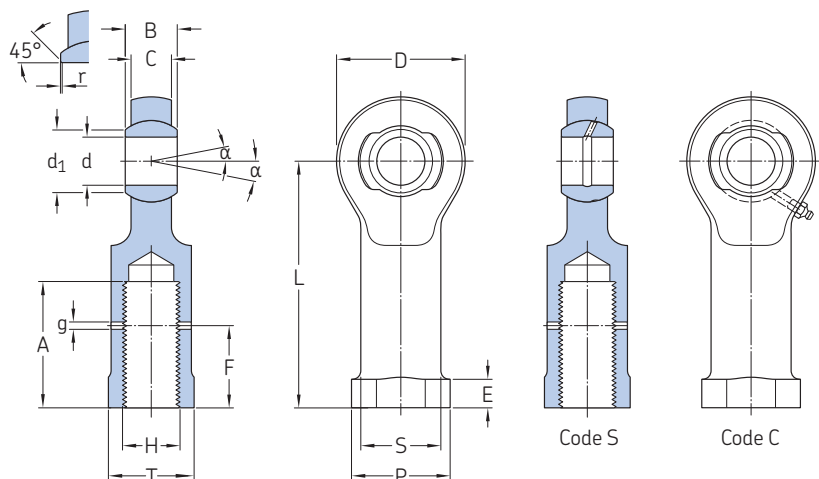
**No code** Grease G354  
**-2** Grease G395

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.6 Internal thread rod end with integrated metal-to-metal spherical plain bearing (metric dimensions)

EF

Technical specification –  
Product standard –



#### Dimensions

| Nominal bore code | Dimensions d | Tolerances $\Delta d_{mp}$ | D  | B    | C    | A   | H MJ 4H 5H | L   | P  | d <sub>1</sub> | g         |
|-------------------|--------------|----------------------------|----|------|------|-----|------------|-----|----|----------------|-----------|
| –                 | mm           | $\mu m$                    | mm |      |      | Min | –          | mm  |    | $\approx$      | $\approx$ |
| 12                | 12           | 0/–8                       | 32 | 13   | 10   | 31  | 14 × 1,5   | 60  | 24 | 12,6           | 1,8       |
| 15                | 15           | 0/–8                       | 40 | 15   | 12   | 35  | 16 × 1,5   | 70  | 26 | 15,6           | 1,8       |
| 17                | 17           | 0/–8                       | 42 | 16,0 | 13,5 | 40  | 18 × 1,5   | 76  | 31 | 17,6           | 1,8       |
| 20                | 20           | 0/–9                       | 51 | 22   | 18   | 49  | 22 × 1,5   | 90  | 34 | 20,6           | 1,8       |
| 25                | 25           | 0/–9                       | 62 | 25   | 20   | 53  | 24 × 2     | 105 | 37 | 25,6           | 1,8       |
| 30                | 30           | 0/–9                       | 70 | 28   | 24   | 60  | 27 × 2     | 120 | 42 | 30,6           | 1,8       |
| 35                | 35           | 0/–11                      | 80 | 31   | 26   | 66  | 33 × 2     | 140 | 53 | 35,6           | 1,8       |
| 40                | 40           | 0/–11                      | 88 | 34   | 29   | 72  | 36 × 2     | 145 | 58 | 40,6           | 1,8       |

#### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions F +0.5/0 | S ±0.1 | T 0/–0.25 | E $\approx$ | r +0,3/0 | $\alpha$ | Mass $\approx$ | Ultimate radial load | Axial clearance EF | EFS/EFC |
|-------------------|---------------------|--------|-----------|-------------|----------|----------|----------------|----------------------|--------------------|---------|
| –                 | mm                  |        |           |             |          | °        | g              | kN                   | $\mu m$            |         |
| 12                | 20                  | 19,5   | 21        | 7           | 0,1      | 10       | 120            | 65                   | 5/25               | 15/40   |
| 15                | 24                  | 22     | 23        | 7           | 0,1      | 8        | 190            | 95                   | 5/25               | 15/40   |
| 17                | 26                  | 24     | 27        | 8           | 0,1      | 7        | 240            | 120                  | 5/25               | 15/40   |
| 20                | 33                  | 29     | 30        | 8           | 0,1      | 8        | 430            | 170                  | 10/30              | 20/45   |
| 25                | 36                  | 32     | 33        | 8           | 0,1      | 8        | 680            | 210                  | 10/30              | 20/45   |
| 30                | 40                  | 36     | 37        | 8           | 0,1      | 6        | 990            | 270                  | 10/30              | 20/45   |
| 35                | 50                  | 44     | 46        | 9           | 0,1      | 7        | 1 570          | 400                  | 15/40              | 25/50   |
| 40                | 54                  | 48     | 50        | 9           | 0,1      | 6        | 1 940          | 475                  | 15/40              | 25/50   |





## Designation system

Examples: XEFS20G-2  
EF12

X EF S 20 G -2

### Material and surface treatment

|         | Inner ring                | Rod end body              |
|---------|---------------------------|---------------------------|
| No code | Bearing steel             | Cadmium plated steel      |
| S       | Bearing steel             | Zinc-nickel plated steel  |
| W       | Corrosion-resistant steel | Cadmium plated steel      |
| SW      | Corrosion-resistant steel | Zinc-nickel plated steel  |
| X       | Corrosion-resistant steel | Corrosion-resistant steel |
| Q       | Bronze beryllium          | Corrosion-resistant steel |

### Basic designation

#### Lubrication grooves

|         |                             |
|---------|-----------------------------|
| No code | Without lubrication groove  |
| S       | Lubrication by inner ring   |
| C       | Lubrication by rod end body |

#### Bore code

#### Thread direction

|         |                   |
|---------|-------------------|
| No code | Right-hand thread |
| G       | Left-hand thread  |

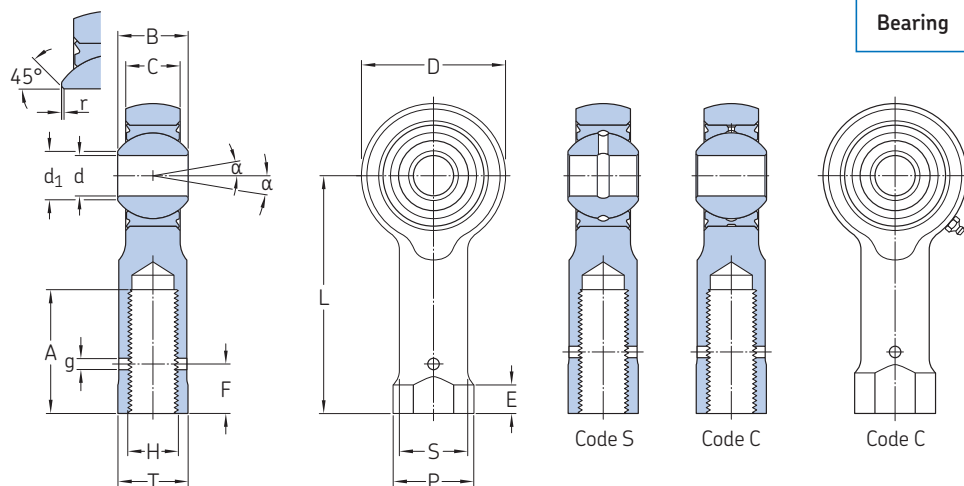
#### Lubricant

|         |             |
|---------|-------------|
| No code | Grease G354 |
| -2      | Grease G395 |

### 3.7 Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions)

EFJ/..ML

|                         |       |
|-------------------------|-------|
| Technical specification | –     |
| Product standard        | –     |
| Bearing                 | ML..R |



#### Dimensions

| Nominal bore code | Dimensions d | Tolerances Δdmp | D    | B    | C    | A  | H MJ 4H 5H | L   | P  | d <sub>1</sub> | g   |
|-------------------|--------------|-----------------|------|------|------|----|------------|-----|----|----------------|-----|
| –                 | mm           | μm              | mm   | mm   | mm   | mm | –          | mm  | mm | mm             | mm  |
| 5                 | 5            | 0/-8            | 21   | 11   | 8,7  | 20 | 8 × 1      | 42  | 15 | 7,7            | 1,8 |
| 6                 | 6            | 0/-8            | 22,5 | 11   | 8,7  | 25 | 10 × 1,25  | 48  | 17 | 7,7            | 1,8 |
| 8                 | 8            | 0/-8            | 26   | 11   | 8,2  | 30 | 12 × 1,25  | 56  | 21 | 10,3           | 1,8 |
| 10                | 10           | 0/-8            | 32   | 12,5 | 10,2 | 31 | 14 × 1,5   | 62  | 24 | 12,2           | 1,8 |
| 12                | 12           | 0/-8            | 37   | 16   | 13,2 | 35 | 16 × 1,5   | 68  | 26 | 15,5           | 1,8 |
| 15                | 15           | 0/-8            | 41,5 | 17   | 13,7 | 44 | 20 × 1,5   | 82  | 31 | 18,9           | 1,8 |
| 17                | 17           | 0/-8            | 43   | 18   | 14,7 | 49 | 22 × 1,5   | 95  | 34 | 20,1           | 1,8 |
| 20                | 20           | 0/-10           | 50   | 20   | 16,2 | 53 | 24 × 2     | 100 | 37 | 23,5           | 1,8 |
| 25                | 25           | 0/-10           | 77   | 32   | 26,2 | 66 | 33 × 2     | 131 | 53 | 35,3           | 1,8 |

#### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions F | S    | T  | E  | r   | α  | Mass ≈ | Radial loads Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Axial clearance Standard | Reduced |
|-------------------|--------------|------|----|----|-----|----|--------|-------------------------------------|--------------------------------|--------------------------|---------|
| –                 | mm           | mm   | mm | mm | mm  | °  | g      | kN                                  |                                | μm                       |         |
| 5                 | 10           | 12   | 13 | 5  | 0,1 | 15 | 50     | 30                                  | 5                              | 17/75                    | 35 max  |
| 6                 | 12           | 14   | 15 | 6  | 0,1 | 15 | 60     | 40                                  | 7,1                            | 17/75                    | 35 max  |
| 8                 | 14           | 17   | 18 | 6  | 0,1 | 14 | 85     | 50                                  | 8,6                            | 17/75                    | 35 max  |
| 10                | 16           | 19,5 | 21 | 7  | 0,1 | 10 | 135    | 90                                  | 14,8                           | 17/75                    | 35 max  |
| 12                | 18           | 22   | 23 | 7  | 0,1 | 10 | 195    | 110                                 | 18,7                           | 17/75                    | 35 max  |
| 15                | 22           | 26   | 27 | 8  | 0,1 | 9  | 275    | 130                                 | 22,3                           | 17/75                    | 35 max  |
| 17                | 24           | 29   | 30 | 8  | 0,1 | 9  | 350    | 150                                 | 24,8                           | 20/80                    | 40 max  |
| 20                | 26           | 32   | 33 | 8  | 0,1 | 8  | 500    | 190                                 | 31,6                           | 20/80                    | 40 max  |
| 25                | 35           | 44   | 46 | 9  | 0,1 | 8  | 1 520  | 475                                 | 78,4                           | 25/100                   | 50 max  |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

## Designation system

Examples: XEFJ/WQMLS 6GX-2  
EFJ/WML20

X EFJ/ WQ ML S 6 G X -2

### Rod end body material

**No code** Cadmium plated steel  
**S** Zinc-nickel plated steel  
**X** Corrosion-resistant steel  
**T<sup>1)</sup>** Anodized titanium

### Basic designation

#### Bearing material

|           | Inner ring                | Outer ring                |
|-----------|---------------------------|---------------------------|
| <b>W</b>  | Corrosion-resistant steel | Corrosion-resistant steel |
| <b>Q</b>  | Bronze beryllium          | Corrosion-resistant steel |
| <b>WQ</b> | Corrosion-resistant steel | Bronze aluminium          |

#### Lubrication grooves

**No code** Without lubrication groove  
**S** Lubrication by inner ring  
**C** Lubrication by rod end body

#### Bore code

#### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

#### Internal clearance

**No code** Standard clearance  
**X** Reduced clearance

#### Lubricant

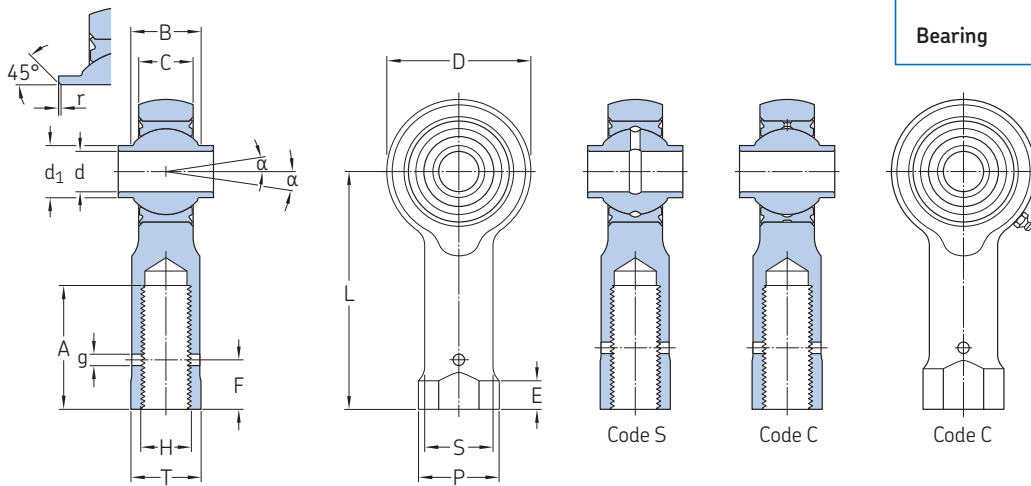
**No code** Grease G354  
**-2** Grease G395

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.8 Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions)

EFJ/..MT

|                         |       |
|-------------------------|-------|
| Technical specification | –     |
| Product standard        | –     |
| Bearing                 | MT..R |



#### Dimensions

| Nominal bore code | Dimensions d | Tolerances Δdmp | D  | B    | C    | A  | H MJ 4H 5H | L   | P  | d <sub>1</sub> | F  |
|-------------------|--------------|-----------------|----|------|------|----|------------|-----|----|----------------|----|
| –                 | mm           | μm              | mm | mm   | mm   | mm | –          | mm  | mm | mm             | mm |
| 5                 | 5            | 0/-8            | 19 | 12,5 | 5,2  | 20 | 8 × 1      | 41  | 15 | 7,8            | 10 |
| 6                 | 6            | 0/-8            | 25 | 15   | 6,2  | 25 | 10 × 1,25  | 50  | 17 | 9,6            | 12 |
| 8                 | 8            | 0/-8            | 35 | 21   | 9,2  | 30 | 12 × 1,25  | 60  | 21 | 13,3           | 14 |
| 10                | 10           | 0/-8            | 35 | 21,0 | 9,2  | 31 | 14 × 1,5   | 63  | 24 | 13,3           | 16 |
| 12                | 12           | 0/-8            | 42 | 24   | 10,2 | 35 | 16 × 1,5   | 72  | 26 | 17,7           | 18 |
| 17                | 17           | 0/-8            | 51 | 30   | 14,2 | 49 | 22 × 1,5   | 94  | 34 | 21,8           | 22 |
| 20                | 20           | 0/-10           | 58 | 33   | 16,2 | 53 | 24 × 2     | 104 | 37 | 24             | 26 |
| 22                | 22           | 0/-10           | 65 | 36   | 16,2 | 54 | 27 × 2     | 112 | 42 | 28,3           | 29 |
| 25                | 25           | 0/-10           | 77 | 48   | 21,2 | 66 | 33 × 2     | 133 | 53 | 32,2           | 35 |

#### Dimensions cont., loads and clearance

| Nominal bore code | Dimensions S ±0.1 | Dimensions T 0/-0.25 | E  | r +0,3/0 | g   | α   | Mass  | Radial loads Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Axial clearance Standard | Reduced |
|-------------------|-------------------|----------------------|----|----------|-----|-----|-------|-------------------------------------|--------------------------------|--------------------------|---------|
| –                 | mm                | mm                   | mm | mm       | mm  | °   | g     | kN                                  |                                | μm                       |         |
| 5                 | 12                | 13                   | 5  | 0,1      | 1,8 | 15  | 35    | 21,2                                | 3,4                            | 17/75                    | 35 max  |
| 6                 | 14                | 15                   | 6  | 0,1      | 1,8 | 24  | 60    | 30,6                                | 4,9                            | 17/75                    | 35 max  |
| 8                 | 17                | 18                   | 6  | 0,1      | 1,8 | 20  | 125   | 76                                  | 12                             | 17/75                    | 35 max  |
| 10                | 19,5              | 21                   | 7  | 0,1      | 1,8 | 20  | 140   | 76                                  | 12,2                           | 17/75                    | 35 max  |
| 12                | 22                | 23                   | 7  | 0,1      | 1,8 | 20  | 220   | 102,1                               | 16,4                           | 17/75                    | 35 max  |
| 17                | 29                | 30                   | 8  | 0,1      | 1,8 | 20° | 430   | 174,8                               | 28,3                           | 17/75                    | 35 max  |
| 20                | 32                | 33                   | 8  | 0,1      | 1,8 | 19  | 600   | 240,1                               | 38,7                           | 20/80                    | 40 max  |
| 22                | 36                | 37                   | 8  | 0,1      | 1,8 | 19  | 750   | 270,5                               | 43,4                           | 20/80                    | 40 max  |
| 25                | 44                | 46                   | 9  | 0,1      | 1,8 | 21  | 1 410 | 401,3                               | 64,9                           | 25/100                   | 50 max  |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292



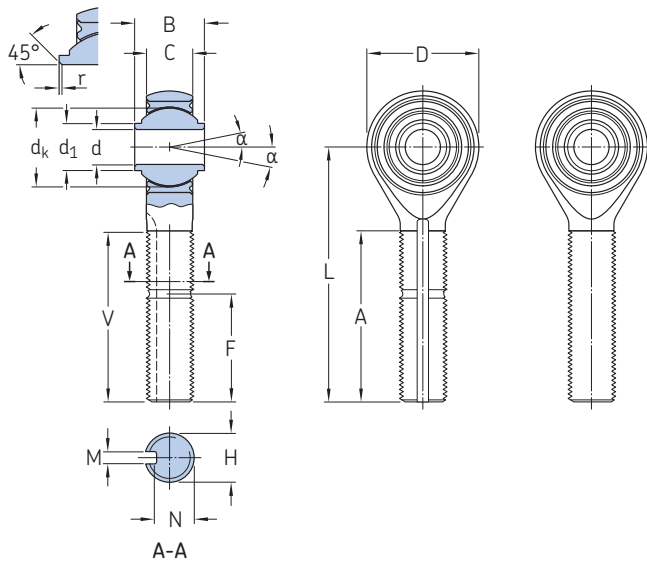
## Designation system

|                              |                             |   |      |    |    |   |   |   |   |    |
|------------------------------|-----------------------------|---|------|----|----|---|---|---|---|----|
| Examples:                    | XEFJ/WQMTS 6GX-2            | X | EFJ/ | WQ | MT | S | 6 | G | X | -2 |
|                              | EFJ/WMT20                   |   |      |    |    |   |   |   |   |    |
| <b>Rod end body material</b> |                             |   |      |    |    |   |   |   |   |    |
| No code                      | Cadmium plated steel        |   |      |    |    |   |   |   |   |    |
| S                            | Zinc-nickel plated steel    |   |      |    |    |   |   |   |   |    |
| X                            | Corrosion-resistant steel   |   |      |    |    |   |   |   |   |    |
| T <sup>1)</sup>              | Anodized titanium           |   |      |    |    |   |   |   |   |    |
| <b>Basic designation</b>     |                             |   |      |    |    |   |   |   |   |    |
| <b>Bearing material</b>      |                             |   |      |    |    |   |   |   |   |    |
|                              | <b>Inner ring</b>           |   |      |    |    |   |   |   |   |    |
| W                            | Corrosion-resistant steel   |   |      |    |    |   |   |   |   |    |
| Q                            | Bronze beryllium            |   |      |    |    |   |   |   |   |    |
| WQ                           | Corrosion-resistant steel   |   |      |    |    |   |   |   |   |    |
|                              | <b>Outer ring</b>           |   |      |    |    |   |   |   |   |    |
|                              | Corrosion-resistant steel   |   |      |    |    |   |   |   |   |    |
|                              | Corrosion-resistant steel   |   |      |    |    |   |   |   |   |    |
|                              | Bronze aluminium            |   |      |    |    |   |   |   |   |    |
| <b>Lubrication grooves</b>   |                             |   |      |    |    |   |   |   |   |    |
| No code                      | Without lubrication groove  |   |      |    |    |   |   |   |   |    |
| S                            | Lubrication by inner ring   |   |      |    |    |   |   |   |   |    |
| C                            | Lubrication by rod end body |   |      |    |    |   |   |   |   |    |
| <b>Bore code</b>             |                             |   |      |    |    |   |   |   |   |    |
| <b>Thread direction</b>      |                             |   |      |    |    |   |   |   |   |    |
| No code                      | Right-hand thread           |   |      |    |    |   |   |   |   |    |
| G                            | Left-hand thread            |   |      |    |    |   |   |   |   |    |
| <b>Internal clearance</b>    |                             |   |      |    |    |   |   |   |   |    |
| No code                      | Standard clearance          |   |      |    |    |   |   |   |   |    |
| X                            | Reduced clearance           |   |      |    |    |   |   |   |   |    |
| <b>Lubricant</b>             |                             |   |      |    |    |   |   |   |   |    |
| No code                      | Grease G354                 |   |      |    |    |   |   |   |   |    |
| -2                           | Grease G395                 |   |      |    |    |   |   |   |   |    |

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.9 External thread inserted self-lubricating spherical plain bearing rod end (metric dimensions)

EMA..., EMA...SP1A..



|                         |                                                                                                               |
|-------------------------|---------------------------------------------------------------------------------------------------------------|
| Technical specification | EN 2068                                                                                                       |
| Product standard        | EN 2498<br>(Cadmium plated steel 30NCD16 rod end)<br>EN 4198 (Corrosion-resistant steel 17-4PH H1025 rod end) |
| Bearing                 | HMEN..R metric                                                                                                |

#### Dimensions

| Nominal bore code         | Dimensions<br>d<br>$\Delta d_{mp}$<br>0/-0,008 | D<br>+0,2/0 | B<br>0/-0,06 | C<br>+0,1/0 | A<br>Min | V<br>+0,5/-1 | H<br>ISO M thread <sup>1)</sup><br>4h 6h | ISO MJ thread (code J)<br>4h 6h | L<br>$\pm 0,5$ | $d_k$<br>$\approx$ | $d_1$<br>$\approx$ |
|---------------------------|------------------------------------------------|-------------|--------------|-------------|----------|--------------|------------------------------------------|---------------------------------|----------------|--------------------|--------------------|
| –                         | mm                                             |             |              |             |          |              | –                                        |                                 | mm             |                    |                    |
| <b>6</b>                  | 6                                              | 22,5        | 14           | 8,2         | 37       | 37           | M10 × 1                                  | MJ10 × 1,25                     | 54             | 15,0               | 9                  |
| <b>8</b>                  | 8                                              | 26          | 15           | 10,2        | 42       | 42           | –                                        | MJ12 × 1,25                     | 62             | 17,5               | 11                 |
| <b>8SP1A<sup>1)</sup></b> | 8                                              | 26          | 15           | 10,2        | 42       | 42           | M12 × 1,5                                | –                               | 62             | 17,5               | 11                 |
| <b>10<sup>2)</sup></b>    | 10                                             | 32          | 20           | 13,2        | 48       | 48           | M14 × 1,5                                | MJ14 × 1,5                      | 73             | 22,2               | 13,5               |

#### Dimensions cont., loads, torque and clearance

| Nominal bore code         | Dimensions<br>F<br>Min | M<br>+0,1/0 | N<br>0/-0,1 | r<br>+0,3/-0,2 | $\alpha$ | Mass<br>$\approx$ | Radial loads<br>Ultimate <sup>3)</sup> | Fatigue<br>10 <sup>6</sup> cycles | Starting torque |
|---------------------------|------------------------|-------------|-------------|----------------|----------|-------------------|----------------------------------------|-----------------------------------|-----------------|
| –                         | mm                     |             |             |                | °        | g                 | kN                                     |                                   | Nm              |
| <b>6</b>                  | 23                     | 2,4         | 8           | 0,5            | 9        | 46                | 27,0                                   | 4,5                               | 0,45/1,3        |
| <b>8</b>                  | 27                     | 2,4         | 10,2        | 0,5            | 8        | 76                | 39,0                                   | 6,0                               | 0,7/2           |
| <b>8SP1A<sup>1)</sup></b> | 27                     | 2,4         | 10,2        | 0,5            | 8        | 76                | 39,0                                   | 6,0                               | 0,7/2           |
| <b>10<sup>2)</sup></b>    | 31                     | 3,2         | 12,2        | 0,5            | 10       | 135               | 58,0                                   | 9,2                               | 0,7/2           |

<sup>1)</sup> SKF option

<sup>2)</sup> The radial dynamic load is limited by the rod end load carrying capability. The C25 value from RL..SP bearing is reduced to 38,6 kN.

<sup>3)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

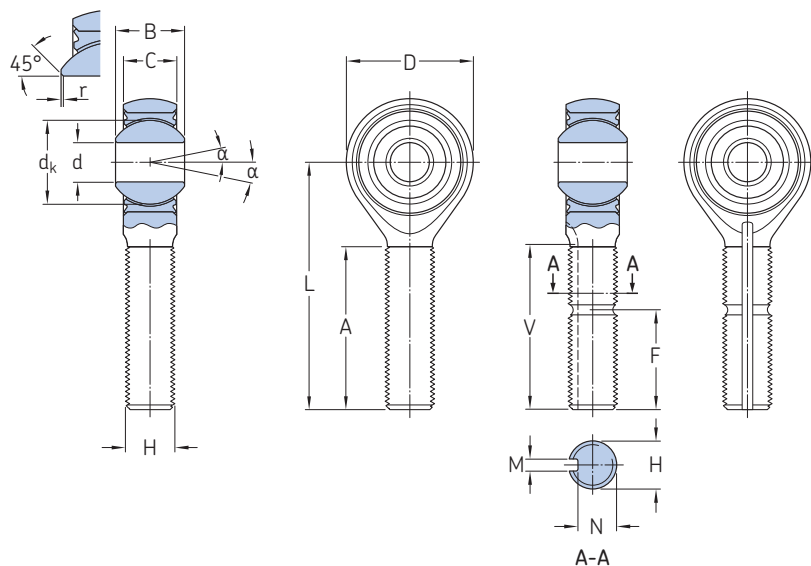
Designation system

|                                                    |                           |   |     |   |   |   |   |   |
|----------------------------------------------------|---------------------------|---|-----|---|---|---|---|---|
| Example:                                           | XEMAJ 6GRK                | X | EMA | J | 6 | G | R | K |
|                                                    | TEMA 8SP1A                |   |     |   |   |   |   |   |
| <b>Rod end body material and surface treatment</b> |                           |   |     |   |   |   |   |   |
| <b>No code</b>                                     | Cadmium plated steel      |   |     |   |   |   |   |   |
| <b>S<sup>1)</sup></b>                              | Zinc-nickel plated steel  |   |     |   |   |   |   |   |
| <b>X</b>                                           | Corrosion resistant steel |   |     |   |   |   |   |   |
| <b>T<sup>2)</sup></b>                              | Anodized titanium         |   |     |   |   |   |   |   |
| <b>Basic designation</b>                           |                           |   |     |   |   |   |   |   |
| <b>Thread profile</b>                              |                           |   |     |   |   |   |   |   |
| <b>No code<sup>1)</sup></b>                        | ISO M Profile thread      |   |     |   |   |   |   |   |
| <b>J</b>                                           | ISO MJ Profile thread     |   |     |   |   |   |   |   |
| <b>Bore code</b>                                   |                           |   |     |   |   |   |   |   |
| <b>Thread direction</b>                            |                           |   |     |   |   |   |   |   |
| <b>No code</b>                                     | Right-hand thread         |   |     |   |   |   |   |   |
| <b>G</b>                                           | Left-hand thread          |   |     |   |   |   |   |   |
| <b>Locating groove</b>                             |                           |   |     |   |   |   |   |   |
| <b>No code</b>                                     | Without locating groove   |   |     |   |   |   |   |   |
| <b>R</b>                                           | With locating groove      |   |     |   |   |   |   |   |
| <b>Keyway</b>                                      |                           |   |     |   |   |   |   |   |
| <b>No code</b>                                     | Without keyway            |   |     |   |   |   |   |   |
| <b>K</b>                                           | With keyway               |   |     |   |   |   |   |   |

1) SKF option  
 2) SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.10 External thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions)

EMJ/RL..



|                         |                         |
|-------------------------|-------------------------|
| Technical specification | EN 2755 for the bearing |
| Product standard        | –                       |
| Bearing                 | WEN ..R metric          |

#### Dimensions

| Nominal bore code | Dimensions d | Tolerances Δdmp | D      | B       | C      | A   | V      | H MJ 4h 6h | L   | d <sub>k</sub> |
|-------------------|--------------|-----------------|--------|---------|--------|-----|--------|------------|-----|----------------|
| –                 | mm           | μm              | +0,2/0 | 0/–0,06 | +0,1/0 | Min | +0,5/0 | –          | mm  | ≈              |
| 5                 | 5            | 0/–8            | 21     | 11      | 8,7    | 28  | 28     | 8 × 1      | 46  | 13,4           |
| 6                 | 6            | 0/–8            | 22,5   | 11      | 8,7    | 37  | 37     | 10 × 1,25  | 54  | 13,4           |
| 8                 | 8            | 0/–8            | 26     | 11      | 8,2    | 42  | 42     | 12 × 1,25  | 62  | 15,1           |
| 10                | 10           | 0/–8            | 32     | 12,5    | 10,2   | 48  | 48     | 14 × 1,5   | 73  | 17,5           |
| 12                | 12           | 0/–8            | 37     | 16      | 13,2   | 56  | 56     | 16 × 1,5   | 85  | 22,3           |
| 15                | 15           | 0/–8            | 41,5   | 17      | 13,7   | 70  | 70     | 20 × 1,5   | 100 | 25,4           |
| 17                | 17           | 0/–8            | 43     | 18      | 14,7   | 78  | 78     | 22 × 1,5   | 107 | 27,0           |
| 20                | 20           | 0/–10           | 50     | 20      | 16,2   | 85  | 85     | 24 × 2     | 121 | 30,9           |
| 25                | 25           | 0/–10           | 77     | 32      | 26,2   | 100 | 100    | 33 × 2     | 154 | 47,6           |

#### Dimensions cont, loads and torque

| Nominal bore code | Dimensions F Min | M +0,1/0 | N 0/–0,1 | r +0,3/0 | α  | Mass ≈ | Radial loads Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Starting torque Standard | Reduced    |
|-------------------|------------------|----------|----------|----------|----|--------|-------------------------------------|--------------------------------|--------------------------|------------|
| –                 | mm               |          |          |          | °  | g      | kN                                  |                                | Nm                       |            |
| 5                 | 18               | 1,6      | 6,6      | 0,1      | 15 | 40     | 30                                  | 5                              | 0,08/1                   | 0,005/0,12 |
| 6                 | 22               | 2,4      | 8        | 0,1      | 15 | 55     | 40                                  | 7,1                            | 0,08/1                   | 0,005/0,12 |
| 8                 | 25               | 2,4      | 10,2     | 0,1      | 14 | 75     | 50                                  | 8,6                            | 0,12/1,6                 | 0,006/0,16 |
| 10                | 31               | 3,2      | 12,2     | 0,1      | 10 | 125    | 90                                  | 14,8                           | 0,12/1,6                 | 0,008/0,2  |
| 12                | 34               | 3,2      | 13,7     | 0,1      | 10 | 195    | 110                                 | 18,7                           | 0,12/1,6                 | 0,008/0,2  |
| 15                | 41               | 4        | 17,4     | 0,1      | 9  | 285    | 130                                 | 22,3                           | 0,12/1,6                 | 0,01/0,24  |
| 17                | 46               | 4        | 19,4     | 0,1      | 9  | 340    | 150                                 | 24,8                           | 0,12/1,6                 | 0,01/0,24  |
| 20                | 50               | 4        | 21,4     | 0,1      | 8  | 490    | 190                                 | 31,6                           | 0,12/1,6                 | 0,01/0,24  |
| 25                | 65               | 4,8      | 30       | 0,1      | 9  | 1 590  | 475                                 | 78,4                           | 0,25/2                   | 0,015/0,5  |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292



## Designation system

Example: XEMJ/RL 6GRKX  
EMJ/RL12

X EMJ/RL 6 G R K X

### Rod end body material

**No code** Cadmium plated 30NCD16 steel  
**S** Zinc-nickel plated 30NCD16 steel  
**X** Corrosion resistant steel 17-4PH H1025  
**T<sup>1)</sup>** Anodized titanium

### Basic designation

#### Bore code

#### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

#### Locating groove

**No code** Without locating groove  
**R** With locating groove

#### Keyway

**No code** Without keyway  
**K** With keyway

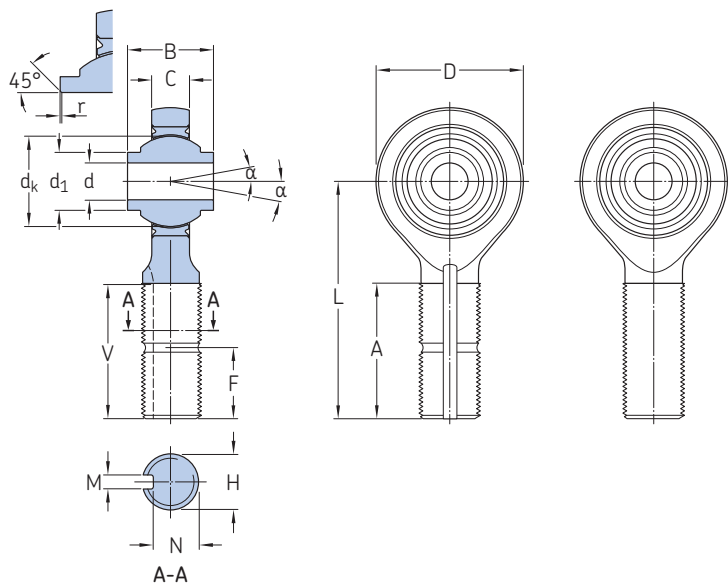
#### Starting torque

**No code** Standard  
**X** Reduced

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.11 External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions)

EMJ/RT..



|                         |               |
|-------------------------|---------------|
| Technical specification | –             |
| Product standard        | –             |
| Bearing                 | XRT..R metric |

#### Dimensions

| Nominal bore code | Dimensions d | Tolerances Δdmp | D  | B    | C    | A   | V   | H MJ 4h 6h | L   | dk   | d1   |
|-------------------|--------------|-----------------|----|------|------|-----|-----|------------|-----|------|------|
| –                 | mm           | μm              | mm | mm   | mm   | mm  | mm  | mm         | mm  | mm   | mm   |
| 5                 | 5            | 0/-8            | 19 | 12,5 | 5,2  | 28  | 28  | 8 × 1      | 45  | 11,1 | 7,8  |
| 6                 | 6            | 0/-8            | 25 | 15   | 6,2  | 37  | 37  | 10 × 1,25  | 58  | 15,1 | 9,6  |
| 8                 | 8            | 0/-8            | 35 | 21   | 9,2  | 42  | 42  | 12 × 1,25  | 71  | 19,8 | 13,3 |
| 10                | 10           | 0/-8            | 35 | 21   | 9,2  | 48  | 48  | 14 × 1,5   | 77  | 19,8 | 13,3 |
| 12                | 12           | 0/-8            | 42 | 24   | 10,2 | 56  | 56  | 16 × 1,5   | 89  | 25,0 | 17,7 |
| 17                | 17           | 0/-8            | 51 | 30   | 14,2 | 78  | 78  | 22 × 1,5   | 115 | 31,5 | 21,8 |
| 20                | 20           | 0/-10           | 58 | 33   | 16,2 | 85  | 85  | 24 × 2     | 128 | 34,0 | 24,0 |
| 22                | 22           | 0/-10           | 65 | 36   | 16,2 | 93  | 93  | 27 × 2     | 140 | 38,9 | 28,3 |
| 25                | 25           | 0/-10           | 77 | 48   | 21,2 | 100 | 100 | 33 × 2     | 154 | 47,6 | 32,2 |

#### Dimensions cont, loads and torque

| Nominal bore code | Dimensions F Min | M +0,1/0 | N 0/-0,1 | r +0,3/0 | α  | Mass ≈ | Radial loads Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Starting torque Standard | Reduced    |
|-------------------|------------------|----------|----------|----------|----|--------|-------------------------------------|--------------------------------|--------------------------|------------|
| –                 | mm               | mm       | mm       | mm       | °  | g      | kN                                  | Nm                             | Nm                       | Nm         |
| 5                 | 18               | 1,6      | 6,6      | 0,1      | 15 | 30     | 21,2                                | 3,4                            | 0,06/0,6                 | 0,005/0,12 |
| 6                 | 22               | 2,4      | 8        | 0,1      | 24 | 55     | 30,6                                | 4,9                            | 0,06/0,6                 | 0,005/0,12 |
| 8                 | 25               | 2,4      | 10,2     | 0,1      | 20 | 115    | 76                                  | 12                             | 0,08/0,8                 | 0,005/0,12 |
| 10                | 31               | 3,2      | 12,2     | 0,1      | 20 | 135    | 76                                  | 12,2                           | 0,1/1                    | 0,008/0,2  |
| 12                | 34               | 3,2      | 13,7     | 0,1      | 20 | 225    | 102,1                               | 16,4                           | 0,1/1                    | 0,008/0,2  |
| 17                | 46               | 4        | 19,4     | 0,1      | 20 | 440    | 174,8                               | 28,3                           | 0,12/1,4                 | 0,008/0,2  |
| 20                | 50               | 4        | 21,4     | 0,1      | 19 | 610    | 240,1                               | 38,7                           | 0,12/1,4                 | 0,008/0,2  |
| 22                | 55               | 4,8      | 24,3     | 0,1      | 19 | 810    | 270,5                               | 43,4                           | 0,25/2                   | 0,015/0,5  |
| 25                | 65               | 4,8      | 30       | 0,1      | 21 | 1 460  | 401,3                               | 64,9                           | 0,25/2                   | 0,015/0,5  |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

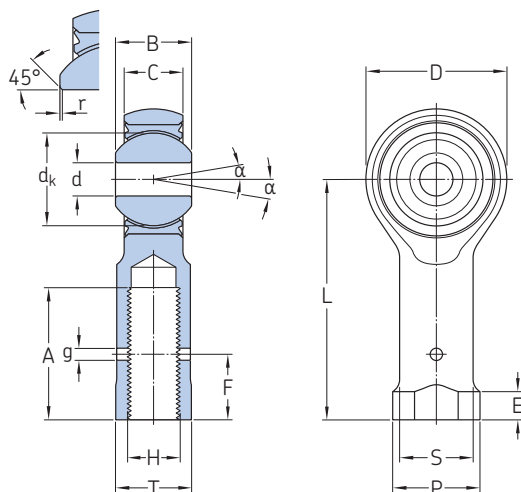
Designation system

|                              |                                        |   |        |   |   |   |   |   |
|------------------------------|----------------------------------------|---|--------|---|---|---|---|---|
| Example:                     | XEMJ/RT 6GRKX                          | X | EMJ/RT | 6 | G | R | K | X |
|                              | EMJ/RT22                               |   |        |   |   |   |   |   |
| <b>Rod end body material</b> |                                        |   |        |   |   |   |   |   |
| No code                      | Cadmium plated 30NCD16 steel           |   |        |   |   |   |   |   |
| S                            | Zinc-nickel plated 30NCD16 steel       |   |        |   |   |   |   |   |
| X                            | Corrosion resistant steel 17-4PH H1025 |   |        |   |   |   |   |   |
| T <sup>1)</sup>              | Anodized titanium                      |   |        |   |   |   |   |   |
| <b>Basic designation</b>     |                                        |   |        |   |   |   |   |   |
| <b>Bore code</b>             |                                        |   |        |   |   |   |   |   |
| <b>Thread direction</b>      |                                        |   |        |   |   |   |   |   |
| No code                      | Right-hand thread                      |   |        |   |   |   |   |   |
| G                            | Left-hand thread                       |   |        |   |   |   |   |   |
| <b>Locating groove</b>       |                                        |   |        |   |   |   |   |   |
| No code                      | Without locating groove                |   |        |   |   |   |   |   |
| R                            | With locating groove                   |   |        |   |   |   |   |   |
| <b>Keyway</b>                |                                        |   |        |   |   |   |   |   |
| No code                      | Without keyway                         |   |        |   |   |   |   |   |
| K                            | With keyway                            |   |        |   |   |   |   |   |
| <b>Starting torque</b>       |                                        |   |        |   |   |   |   |   |
| No code                      | Standard                               |   |        |   |   |   |   |   |
| X                            | Reduced                                |   |        |   |   |   |   |   |

1) SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.12 Internal thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions)

EFJ/RL..



|                         |                            |
|-------------------------|----------------------------|
| Technical specification | EN 2755<br>for the bearing |
| Product standard        | –                          |
| Bearing                 | WEN..R metric              |

#### Dimensions

| Nominal bore code | Dimensions d | Tolerances Δdmp | D      | B       | C      | A   | H MJ 4H 5H | L    | P    | d <sub>k</sub> |
|-------------------|--------------|-----------------|--------|---------|--------|-----|------------|------|------|----------------|
| –                 | mm           | μm              | +0,2/0 | 0/–0,06 | +0,1/0 | Min | –          | ±0,5 | ±0,2 | ≈              |
| 5                 | 5            | 0/–8            | 21     | 11      | 8,7    | 20  | 8 × 1      | 42   | 15   | 13,4           |
| 6                 | 6            | 0/–8            | 22,5   | 11      | 8,7    | 25  | 10 × 1,25  | 48   | 17   | 13,4           |
| 8                 | 8            | 0/–8            | 26     | 11      | 8,2    | 30  | 12 × 1,25  | 56   | 21   | 15,1           |
| 10                | 10           | 0/–8            | 32     | 12,5    | 10,2   | 31  | 14 × 1,5   | 62   | 24   | 17,5           |
| 12                | 12           | 0/–8            | 37     | 16      | 13,2   | 35  | 16 × 1,5   | 68   | 26   | 22,3           |
| 15                | 15           | 0/–8            | 41,5   | 17      | 13,7   | 44  | 20 × 1,5   | 82   | 31   | 25,4           |
| 17                | 17           | 0/–8            | 43     | 18      | 14,7   | 49  | 22 × 1,5   | 95   | 34   | 27,0           |
| 20                | 20           | 0/–10           | 50     | 20      | 16,2   | 53  | 24 × 2     | 100  | 37   | 30,9           |
| 25                | 25           | 0/–10           | 77     | 32      | 26,2   | 66  | 33 × 2     | 131  | 53   | 47,6           |

#### Dimensions cont, loads and torque

| Nominal bore code | Dimensions F | S    | T  | E  | r   | g   | α  | Mass ≈ | Radial loads Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Starting torque Standard | Reduced    |
|-------------------|--------------|------|----|----|-----|-----|----|--------|-------------------------------------|--------------------------------|--------------------------|------------|
| –                 | mm           | mm   | mm | mm | mm  | mm  | °  | g      | kN                                  |                                | Nm                       |            |
| 5                 | 10           | 12   | 13 | 5  | 0,1 | 1,8 | 15 | 50     | 30                                  | 5                              | 0,08/1                   | 0,005/0,12 |
| 6                 | 12           | 14   | 15 | 6  | 0,1 | 1,8 | 15 | 60     | 40                                  | 7,1                            | 0,08/1                   | 0,005/0,12 |
| 8                 | 14           | 17   | 18 | 6  | 0,1 | 1,8 | 14 | 85     | 50                                  | 8,6                            | 0,12/1,6                 | 0,006/0,16 |
| 10                | 16           | 19,5 | 21 | 7  | 0,1 | 1,8 | 10 | 135    | 90                                  | 14,8                           | 0,12/1,6                 | 0,008/0,2  |
| 12                | 18           | 22   | 23 | 7  | 0,1 | 1,8 | 10 | 195    | 110                                 | 18,7                           | 0,12/1,6                 | 0,008/0,2  |
| 15                | 22           | 26   | 27 | 8  | 0,1 | 1,8 | 9  | 275    | 130                                 | 22,3                           | 0,12/1,6                 | 0,01/0,24  |
| 17                | 24           | 29   | 30 | 8  | 0,1 | 1,8 | 9  | 350    | 150                                 | 24,8                           | 0,12/1,6                 | 0,01/0,24  |
| 20                | 26           | 32   | 33 | 8  | 0,1 | 1,8 | 8  | 500    | 190                                 | 31,6                           | 0,12/1,6                 | 0,01/0,24  |
| 25                | 35           | 44   | 46 | 9  | 0,1 | 1,8 | 8  | 1 520  | 475                                 | 78,4                           | 0,25/2                   | 0,015/0,5  |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

## Designation system

Example: XEFJ/RL 6GX  
EFJ/RL25

### Rod end body material and surface treatment

**No code** Cadmium plated 30NCD16 steel  
**S** Zinc-nickel plated 30NCD16 steel  
**X** Corrosion resistant steel 17-4PH H1025  
**T<sup>1)</sup>** Anodized titanium

### Basic designation

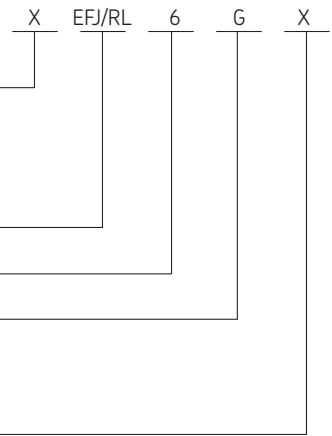
#### Bore code

#### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

### Starting torque

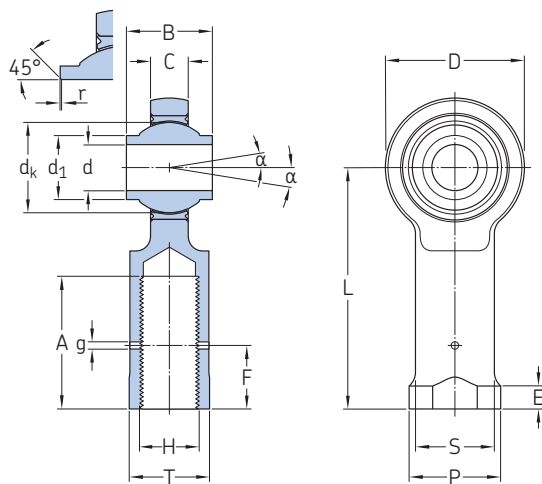
**No code** Standard  
**X** Reduced



<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.13 Internal thread inserted high misalignment self-lubricating spherical plain bearing rod end (metric dimensions)

EFJ/RT..



|                         |        |
|-------------------------|--------|
| Technical specification | –      |
| Product standard        | –      |
| Bearing                 | XRT..R |

3.13

#### Dimensions

| Nominal bore code | Dimensions d | Tolerances Δdmp | D  | B    | C    | A  | H MJ 4H 5H | L   | P  | dk   | d1   | g   | F +0.5/0 |
|-------------------|--------------|-----------------|----|------|------|----|------------|-----|----|------|------|-----|----------|
| –                 | mm           | μm              | mm | mm   | mm   | mm | mm         | mm  | mm | mm   | mm   | mm  | mm       |
| 5                 | 5            | 0/–8            | 19 | 12,5 | 5,2  | 20 | 8 × 1      | 41  | 15 | 11,1 | 7,8  | 1,8 | 10       |
| 6                 | 6            | 0/–8            | 25 | 15   | 6,2  | 25 | 10 × 1,25  | 50  | 17 | 15,1 | 9,6  | 1,8 | 12       |
| 8                 | 8            | 0/–8            | 35 | 21   | 9,2  | 30 | 12 × 1,25  | 60  | 21 | 19,8 | 13,3 | 1,8 | 14       |
| 10                | 10           | 0/–8            | 35 | 21   | 9,2  | 31 | 14 × 1,5   | 63  | 24 | 19,8 | 13,3 | 1,8 | 16       |
| 12                | 12           | 0/–8            | 42 | 24   | 10,2 | 35 | 16 × 1,5   | 72  | 26 | 25,0 | 17,7 | 1,8 | 18       |
| 17                | 17           | 0/–8            | 51 | 30   | 14,2 | 49 | 22 × 1,5   | 94  | 34 | 31,5 | 21,8 | 1,8 | 22       |
| 20                | 20           | 0/–10           | 58 | 33   | 16,2 | 53 | 24 × 2     | 104 | 37 | 34,0 | 24,0 | 1,8 | 26       |
| 22                | 22           | 0/–10           | 65 | 36   | 16,2 | 54 | 27 × 2     | 112 | 42 | 38,9 | 28,3 | 1,8 | 29       |
| 25                | 25           | 0/–10           | 77 | 48   | 21,2 | 66 | 33 × 2     | 133 | 53 | 47,6 | 32,2 | 1,8 | 35       |

#### Dimensions cont., loads and torque

| Nominal bore code | Dimensions S ±0.1 | Dimensions T 0/–0.25 | E ≈ | r +0,3/0 | α  | Mass ≈ | Radial loads Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Starting torque Standard | Reduced    |
|-------------------|-------------------|----------------------|-----|----------|----|--------|-------------------------------------|--------------------------------|--------------------------|------------|
| –                 | mm                | mm                   | mm  | mm       | °  | g      | kN                                  |                                | Nm                       |            |
| 5                 | 12                | 13                   | 5   | 0,1      | 15 | 35     | 21,2                                | 3,4                            | 0,06/0,6                 | 0,005/0,12 |
| 6                 | 14                | 15                   | 6   | 0,1      | 24 | 60     | 30,6                                | 4,9                            | 0,06/0,6                 | 0,005/0,12 |
| 8                 | 17                | 18                   | 6   | 0,1      | 20 | 125    | 76                                  | 12                             | 0,08/0,8                 | 0,005/0,12 |
| 10                | 19,5              | 21                   | 7   | 0,1      | 20 | 140    | 76                                  | 12,2                           | 0,1/1                    | 0,0008/0,2 |
| 12                | 22                | 23                   | 7   | 0,1      | 20 | 220    | 102,1                               | 16,4                           | 0,1/1                    | 0,0008/0,2 |
| 17                | 29                | 30                   | 8   | 0,1      | 20 | 430    | 174,8                               | 28,3                           | 0,12/1,4                 | 0,0008/0,2 |
| 20                | 32                | 33                   | 8   | 0,1      | 19 | 600    | 240,1                               | 38,7                           | 0,12/1,4                 | 0,0008/0,2 |
| 22                | 36                | 37                   | 8   | 0,1      | 19 | 750    | 270,5                               | 43,4                           | 0,25/2                   | 0,015/0,5  |
| 25                | 44                | 46                   | 9   | 0,1      | 21 | 1 410  | 401,3                               | 64,9                           | 0,25/2                   | 0,015/0,5  |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

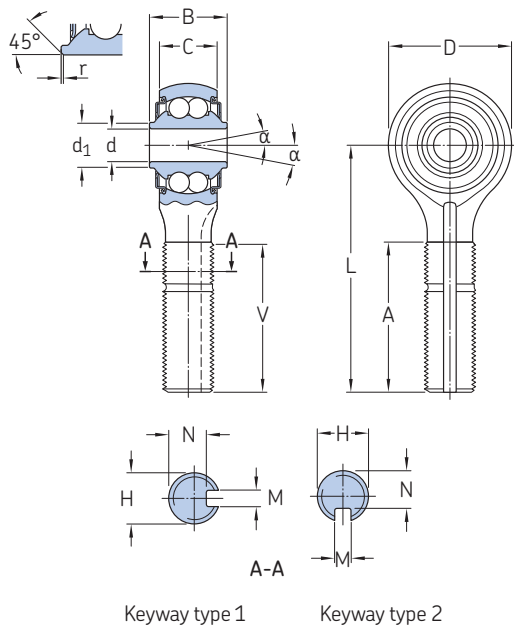
Designation system

|                              |                                        |   |        |   |   |   |
|------------------------------|----------------------------------------|---|--------|---|---|---|
| Examples:                    | XEFJ/RT 6GX<br>EFJ/RT22                | X | EFJ/RT | 6 | G | X |
| <b>Rod end body material</b> |                                        |   |        |   |   |   |
| No code                      | Cadmium plated 30NCD16 steel           |   |        |   |   |   |
| S                            | Zinc-nickel plated 30NCD16 steel       |   |        |   |   |   |
| X                            | Corrosion-resistant steel 17-4PH H1025 |   |        |   |   |   |
| T <sup>1)</sup>              | Anodized titanium                      |   |        |   |   |   |
| <b>Basic designation</b>     |                                        |   |        |   |   |   |
| <b>Bore code</b>             |                                        |   |        |   |   |   |
| <b>Thread direction</b>      |                                        |   |        |   |   |   |
| No code                      | Right-hand thread                      |   |        |   |   |   |
| G                            | Left-hand thread                       |   |        |   |   |   |
| <b>Starting torque</b>       |                                        |   |        |   |   |   |
| No code                      | Standard                               |   |        |   |   |   |
| X                            | Reduced                                |   |        |   |   |   |

1) SKF option, masses and load carrying capability reduced compared to steel rod end body.

### 3.14 External thread rod end with integrated rolling bearing (inch dimensions)

CN..SP bore code 6,35..SP24 to 7,94..SP4 and 6,35..SP18 to 7,94..SP11



|                         |      |
|-------------------------|------|
| Technical specification | –    |
| Product standard        | –    |
| Grease                  | G354 |

3.14

#### Dimensions

| Nominal bore code                                 | Keyway type | Dimensions                |                       |                           |                       |             |                        |                     |                     |               |                           |
|---------------------------------------------------|-------------|---------------------------|-----------------------|---------------------------|-----------------------|-------------|------------------------|---------------------|---------------------|---------------|---------------------------|
|                                                   |             | d<br>0/-0.0005<br>0/-0,13 | D<br>±0.010<br>±0,254 | B<br>0/-0.005<br>0/-0,127 | C<br>±0.005<br>±0,127 | A<br>≈      | V<br>+0.02/0<br>+0,5/0 | d <sub>1</sub><br>≈ | H<br>3A             | L<br>≈        | M<br>+0.005/0<br>+0,127/0 |
| –                                                 |             | in/mm                     |                       |                           |                       |             |                        |                     | –                   | mm            |                           |
| 6,35..SP24 <sup>1)</sup> 6,35..SP18 <sup>2)</sup> | 1           | 0.2500<br>6,350           | 0.886<br>22,5         | 0.551<br>14               | 0.394<br>10           | 1.063<br>27 | 1.063<br>27            | 0.335<br>8,500      | 1/4-28<br>6,35-28   | 2.126<br>54   | 0.063<br>1,6              |
| 6,35..SP6 <sup>1)</sup> 6,35..SP23 <sup>2)</sup>  | 1           | 0.2500<br>6,350           | 0.886<br>22,5         | 0.551<br>14               | 0.394<br>10           | 1.457<br>37 | 1.457<br>37            | 0.335<br>8,500      | 5/16-24<br>7,94-24  | 2.126<br>54   | 0.063<br>1,6              |
| 6,35..SP21 <sup>1)</sup> 6,35..SP8 <sup>2)</sup>  | 2           | 0.2500<br>6,350           | 0.886<br>22,5         | 0.551<br>14               | 0.394<br>10           | 1.457<br>37 | 1.457<br>37            | 0.335<br>8,500      | 3/8-24<br>9,52-24   | 2.126<br>54   | 0.095<br>2,4              |
| 6,35..SP19 <sup>1)</sup> 6,35..SP19 <sup>2)</sup> | 1           | 0.2500<br>6,350           | 0.886<br>22,5         | 0.551<br>14               | 0.394<br>10           | 1.654<br>42 | 1.654<br>42            | 0.335<br>8,500      | 7/16-20<br>11,11-20 | 2.362<br>60   | 0.095<br>2,4              |
| 6,35..SP20 <sup>1)</sup> 6,35..SP20 <sup>2)</sup> | 1           | 0.2500<br>6,350           | 0.886<br>22,5         | 0.551<br>14               | 0.394<br>10           | 2.047<br>52 | 2.047<br>52            | 0.335<br>8,500      | 1/2-20<br>12,7-20   | 3.051<br>77,5 | 0.095<br>2,4              |
| 6,35..SP21 <sup>1)</sup> 6,35..SP21 <sup>2)</sup> | 1           | 0.2500<br>6,350           | 0.886<br>22,5         | 0.551<br>14               | 0.394<br>10           | 2.323<br>59 | 2.323<br>59            | 0.335<br>8,500      | 9/16-18<br>14,29-18 | 3.346<br>85   | 0.126<br>3,2              |
| 6,35..SP22 <sup>1)</sup> 6,35..SP22 <sup>2)</sup> | 1           | 0.2500<br>6,350           | 0.886<br>22,5         | 0.551<br>14               | 0.394<br>10           | 2.480<br>63 | 2.480<br>63            | 0.335<br>8,500      | 5/8-18<br>15,87-18  | 3.150<br>80   | 0.126<br>3                |
| 7,94..SP7 <sup>1)</sup> 7,94..SP7 <sup>2)</sup>   | 1           | 0.3125<br>7,938           | 1.122<br>28,5         | 0.591<br>15               | 0.394<br>10           | 1.457<br>37 | 1.457<br>37            | 0.449<br>11,400     | 5/16-24<br>7,94-24  | 2.362<br>60   | 0.063<br>1,6              |
| 7,94..SP4 <sup>1)</sup> 7,94..SP11 <sup>2)</sup>  | 1           | 0.3125<br>7,938           | 1.122<br>28,5         | 0.591<br>15               | 0.394<br>10           | 1.457<br>37 | 1.457<br>37            | 0.449<br>11,400     | 3/8-24<br>9,52-24   | 2.362<br>60   | 0.095<br>2,4              |

<sup>1)</sup> For bearing steel bearing and cadmium plated steel rod end body (No code), or for bearing steel bearing and zinc-nickel plated steel rod end body (Code S)

<sup>2)</sup> For other materials/surface treatments (codes W, SW, X, ZX and SZX)



## Designation system

Examples: ZXCN 6,35MESP24GRF  
WCN 6,35SP23

### Material and surface treatment

| Inner ring and ball |                           | Rod end body                                 |
|---------------------|---------------------------|----------------------------------------------|
| No code             | Bearing steel             | Cadmium plated steel                         |
| S                   | Bearing steel             | Zinc-nickel plated steel                     |
| W                   | Corrosion-resistant steel | Cadmium plated steel                         |
| SW                  | Corrosion-resistant steel | Zinc-nickel plated steel                     |
| X                   | Corrosion-resistant steel | Corrosion-resistant steel                    |
| ZX                  | Corrosion-resistant steel | Cadmium plated corrosion-resistant steel     |
| SZX                 | Corrosion-resistant steel | Zinc-nickel plated corrosion-resistant steel |

### Basic designation

#### Bore code

#### Thread profile

|   |                     |
|---|---------------------|
| M | UNF profile thread  |
| J | UNJF profile thread |

#### Shield and seal

|         |          |
|---------|----------|
| No code | Shielded |
| E       | Sealed   |

#### Thread direction

|         |                   |
|---------|-------------------|
| No code | Right-hand thread |
| G       | Left-hand thread  |

#### Locating groove

|         |                         |
|---------|-------------------------|
| No code | Without locating groove |
| R       | With locating groove    |

#### Keyway

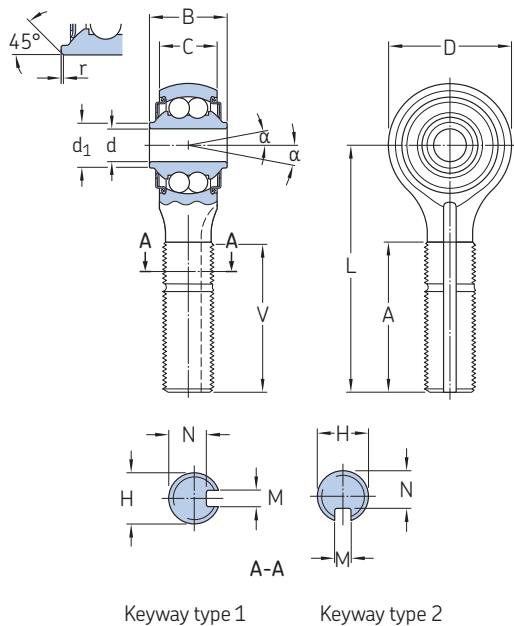
|         |                |
|---------|----------------|
| No code | With keyway    |
| F       | Without keyway |

## Dimensions cont. loads, torque and clearance

| Nominal bore code                                   | Keyway type | Dimensions                |                          | $\alpha$ | Mass $\approx$ | Limit static loads |                | Axial clearance Max | Swivelling torque Max |
|-----------------------------------------------------|-------------|---------------------------|--------------------------|----------|----------------|--------------------|----------------|---------------------|-----------------------|
|                                                     |             | N<br>+0.005/0<br>+0.127/0 | r<br>+0.014/0<br>+0.35/0 |          |                | Radial<br>$C_s$    | Axial<br>$C_a$ |                     |                       |
| –                                                   |             | in/mm                     |                          | °        | lb/g           | lbf/kN             |                | in/mm               | oz.in/mN.             |
| 6,35..SP24 <sup>1)</sup> 6,35..SP18 <sup>2)</sup> 1 |             | 0.202<br>5,11             | 0.006<br>0,15            | 8        | 0.08<br>37     | 1 529<br>6,8       | 472<br>2,1     | 0.003<br>0,080      | 21.242<br>150         |
| 6,35..SP6 <sup>1)</sup> 6,35..SP23 <sup>2)</sup> 1  |             | 0.260<br>6,6              | 0.006<br>0,15            | 8        | 0.09<br>41     | 1 529<br>6,8       | 472<br>2,1     | 0.003<br>0,080      | 21.242<br>150         |
| 6,35..SP21 <sup>1)</sup> 6,35..SP8 <sup>2)</sup> 2  |             | 0.311<br>7,9              | 0.006<br>0,15            | 8        | 0.10<br>46     | 1 529<br>6,8       | 472<br>2,1     | 0.003<br>0,080      | 21.242<br>150         |
| 6,35..SP19 <sup>1)</sup> 6,35..SP19 <sup>2)</sup> 1 |             | 0.370<br>9,4              | 0.006<br>0,15            | 8        | 0.12<br>56     | 1 529<br>6,8       | 472<br>2,1     | 0.003<br>0,080      | 21.242<br>150         |
| 6,35..SP20 <sup>1)</sup> 6,35..SP20 <sup>2)</sup> 1 |             | 0.436<br>11,07            | 0.006<br>0,15            | 8        | 0.16<br>73     | 1 529<br>6,8       | 472<br>2,1     | 0.003<br>0,080      | 21.242<br>150         |
| 6,35..SP21 <sup>1)</sup> 6,35..SP21 <sup>2)</sup> 1 |             | 0.478<br>12,14            | 0.006<br>0,15            | 8        | 0.17<br>77     | 1 529<br>6,8       | 472<br>2,1     | 0.003<br>0,080      | 21.242<br>150         |
| 6,35..SP22 <sup>1)</sup> 6,35..SP22 <sup>2)</sup> 1 |             | 0.539<br>13,7             | 0.006<br>0,15            | 8        | 0.22<br>98     | 1 529<br>6,8       | 472<br>2,1     | 0.003<br>0,080      | 21.242<br>150         |
| 7,94..SP7 <sup>1)</sup> 7,94..SP7 <sup>2)</sup> 1   |             | 0.260<br>6,6              | 0.006<br>0,15            | 8        | 0.13<br>60     | 2 424<br>10,8      | 764<br>3,4     | 0.003<br>0,080      | 28.322<br>200         |
| 7,94..SP4 <sup>1)</sup> 7,94..SP11 <sup>2)</sup> 1  |             | 0.311<br>7,9              | 0.006<br>0,15            | 8        | 0.14<br>64     | 2 424<br>10,8      | 764<br>3,4     | 0.003<br>0,080      | 28.322<br>200         |

### 3.14 External thread rod end with integrated rolling bearing (inch dimensions)

CN..SP bore code 7,94..SP5 to 9,52..SP7 and 7,94..SP2 to 9,52..SP7



|                         |      |
|-------------------------|------|
| Technical specification | –    |
| Product standard        | –    |
| Grease                  | G354 |

#### Dimensions

| Nominal bore code        |                          | Keyway type | Dimensions |       | D      | B        | C      | A     | V       | d <sub>1</sub> | H     | L     | M        |
|--------------------------|--------------------------|-------------|------------|-------|--------|----------|--------|-------|---------|----------------|-------|-------|----------|
|                          |                          |             | d          |       |        |          |        |       |         |                |       |       |          |
|                          |                          |             | 0/-0.0005  |       | ±0.010 | 0/-0.005 | ±0.005 | ≈     | +0.02/0 | ≈              | 3A    | ≈     | +0.005/0 |
|                          |                          |             | 0/-0.13    |       | ±0.254 | 0/-0.127 | ±0.127 |       | +0.5/0  |                |       |       | +0.127/0 |
| –                        |                          |             | in/mm      |       |        |          |        |       |         |                | –     | in/mm |          |
| 7,94..SP5 <sup>1)</sup>  | 7,94..SP2 <sup>2)</sup>  | 2           | 0.3125     | 1.122 | 0.591  | 0.394    | 1.654  | 1.654 | 0.449   | 7/16-20        | 2.441 | 0.095 |          |
|                          |                          |             | 7,938      | 28,5  | 15     | 10       | 42     | 42    | 11,400  | 11,11-20       | 62    | 2,4   |          |
| 7,94..SP8 <sup>1)</sup>  | 7,94..SP8 <sup>2)</sup>  | 1           | 0.3125     | 1.122 | 0.591  | 0.394    | 2.047  | 2.047 | 0.449   | 1/2-20         | 2.913 | 0.095 |          |
|                          |                          |             | 7,938      | 28,5  | 15     | 10       | 52     | 52    | 11,400  | 12,7-20        | 74    | 2,4   |          |
| 7,94..SP12 <sup>1)</sup> | 7,94..SP9 <sup>2)</sup>  | 1           | 0.3125     | 1.122 | 0.591  | 0.394    | 2.323  | 2.323 | 0.449   | 9/16-18        | 3.150 | 0.126 |          |
|                          |                          |             | 7,938      | 28,5  | 15     | 10       | 59     | 59    | 11,400  | 14,29-18       | 80    | 3,2   |          |
| 7,94..SP10 <sup>1)</sup> | 7,94..SP10 <sup>2)</sup> | 1           | 0.3125     | 1.122 | 0.591  | 0.394    | 2.480  | 2.480 | 0.449   | 5/8-18         | 3.268 | 0.126 |          |
|                          |                          |             | 7,938      | 28,5  | 15     | 10       | 63     | 63    | 11,400  | 15,87-18       | 83    | 3,2   |          |
| 9,52..SP4 <sup>1)</sup>  | 9,52..SP4 <sup>2)</sup>  | 1           | 0.3750     | 1.260 | 0.787  | 0.551    | 1.457  | 1.457 | 0.535   | 3/8-24         | 2.441 | 0.095 |          |
|                          |                          |             | 9,525      | 32    | 20     | 14       | 37     | 37    | 13,589  | 9,52-24        | 62    | 2,4   |          |
| 9,52..SP5 <sup>1)</sup>  | 9,52..SP5 <sup>2)</sup>  | 1           | 0.3750     | 1.260 | 0.787  | 0.551    | 1.654  | 1.654 | 0.535   | 7/16-20        | 2.638 | 0.095 |          |
|                          |                          |             | 9,525      | 32    | 20     | 14       | 42     | 42    | 13,589  | 11,11-20       | 67    | 2,4   |          |
| 9,52..SP6 <sup>1)</sup>  | 9,52..SP6 <sup>2)</sup>  | 1           | 0.3750     | 1.260 | 0.787  | 0.551    | 2.047  | 2.047 | 0.535   | 1/2-20         | 2.953 | 0.095 |          |
|                          |                          |             | 9,525      | 32    | 20     | 14       | 52     | 52    | 13,589  | 12,7-20        | 75    | 2,4   |          |
| 9,52..SP2 <sup>1)</sup>  | 9,52..SP3 <sup>2)</sup>  | 2           | 0.3750     | 1.260 | 0.787  | 0.551    | 1.890  | 1.890 | 0.535   | 9/16-18        | 2.874 | 0.126 |          |
|                          |                          |             | 9,525      | 32    | 20     | 14       | 48     | 48    | 13,589  | 14,29-18       | 73    | 3,2   |          |
| 9,52..SP7 <sup>1)</sup>  | 9,52..SP7 <sup>2)</sup>  | 1           | 0.3750     | 1.260 | 0.787  | 0.551    | 2.480  | 2.480 | 0.535   | 5/8-18         | 3.346 | 0.126 |          |
|                          |                          |             | 9,525      | 32    | 20     | 14       | 63     | 63    | 13,589  | 15,87-18       | 85    | 3,2   |          |

<sup>1)</sup> For bearing steel bearing and cadmium plated steel rod end body (No code), or for bearing steel bearing and zinc-nickel plated steel rod end body (Code S)

<sup>2)</sup> For other materials/surface treatments (codes W, SW, X, ZX and SZX)

## Designation system

Examples: ZXCN 6,35MESP24GRF  
WCN 6,35SP23

### Material and surface treatment

| No code | Inner ring and ball       | Rod end body                                 |
|---------|---------------------------|----------------------------------------------|
| S       | Bearing steel             | Cadmium plated steel                         |
| W       | Bearing steel             | Zinc-nickel plated steel                     |
| SW      | Corrosion-resistant steel | Cadmium plated steel                         |
| X       | Corrosion-resistant steel | Zinc-nickel plated steel                     |
| ZX      | Corrosion-resistant steel | Corrosion-resistant steel                    |
| SZX     | Corrosion-resistant steel | Cadmium plated corrosion-resistant steel     |
|         |                           | Zinc-nickel plated corrosion-resistant steel |

### Basic designation

#### Bore code

#### Thread profile

|   |                     |
|---|---------------------|
| M | UNF profile thread  |
| J | UNJF profile thread |

#### Shield and seal

|         |          |
|---------|----------|
| No code | Shielded |
| E       | Sealed   |

#### Thread direction

|         |                   |
|---------|-------------------|
| No code | Right-hand thread |
| G       | Left-hand thread  |

#### Locating groove

|         |                         |
|---------|-------------------------|
| No code | Without locating groove |
| R       | With locating groove    |

#### Keyway

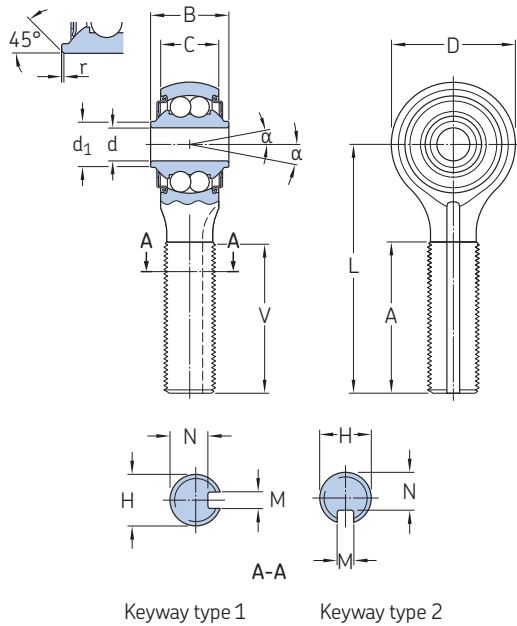
|         |                |
|---------|----------------|
| No code | With keyway    |
| F       | Without keyway |

## Dimensions cont. loads, torque and clearance

| Nominal bore code        |                          | Keyway type | Dimensions                |                          | $\alpha$ | Mass $\approx$ | Limit static loads |                | Axial clearance Max | Swivelling torque Max |
|--------------------------|--------------------------|-------------|---------------------------|--------------------------|----------|----------------|--------------------|----------------|---------------------|-----------------------|
|                          |                          |             | N<br>+0.005/0<br>+0.127/0 | r<br>+0.014/0<br>+0.35/0 |          |                | Radial<br>$C_s$    | Axial<br>$C_a$ |                     |                       |
| –                        |                          |             | in/mm                     |                          | °        | lb/g           | lbf/kN             |                | in/mm               | oz.in/mN.             |
| 7,94..SP5 <sup>1)</sup>  | 7,94..SP2 <sup>2)</sup>  | 2           | 0.370<br>9,4              | 0.006<br>0,15            | 8        | 0.08<br>37     | 2 424<br>10,8      | 764<br>3,4     | 0.003<br>0,080      | 28.322<br>200         |
| 7,94..SP8 <sup>1)</sup>  | 7,94..SP8 <sup>2)</sup>  | 1           | 0.436<br>11,07            | 0.006<br>0,15            | 8        | 0.09<br>41     | 2 424<br>10,8      | 764<br>3,4     | 0.003<br>0,080      | 28.322<br>200         |
| 7,94..SP12 <sup>1)</sup> | 7,94..SP9 <sup>2)</sup>  | 1           | 0.478<br>12,14            | 0.006<br>0,15            | 8        | 0.10<br>46     | 2 424<br>10,8      | 764<br>3,4     | 0.003<br>0,080      | 28.322<br>200         |
| 7,94..SP10 <sup>1)</sup> | 7,94..SP10 <sup>2)</sup> | 1           | 0.539<br>13,7             | 0.006<br>0,15            | 8        | 0.12<br>56     | 2 424<br>10,8      | 764<br>3,4     | 0.003<br>0,080      | 28.322<br>200         |
| 9,52..SP4 <sup>1)</sup>  | 9,52..SP4 <sup>2)</sup>  | 1           | 0.311<br>7,9              | 0.006<br>0,15            | 8        | 0.16<br>73     | 3 147<br>14,0      | 989<br>4,4     | 0.003<br>0,080      | 28.322<br>200         |
| 9,52..SP5 <sup>1)</sup>  | 9,52..SP5 <sup>2)</sup>  | 1           | 0.370<br>9,4              | 0.006<br>0,15            | 8        | 0.17<br>77     | 3 147<br>14,0      | 989<br>4,4     | 0.003<br>0,080      | 28.322<br>200         |
| 9,52..SP6 <sup>1)</sup>  | 9,52..SP6 <sup>2)</sup>  | 1           | 0.436<br>11,07            | 0.006<br>0,15            | 8        | 0.22<br>98     | 3 147<br>14,0      | 989<br>4,4     | 0.003<br>0,080      | 28.322<br>200         |
| 9,52..SP2 <sup>1)</sup>  | 9,52..SP3 <sup>2)</sup>  | 2           | 0.478<br>12,14            | 0.006<br>0,15            | 8        | 0.13<br>60     | 3 147<br>14,0      | 989<br>4,4     | 0.003<br>0,080      | 28.322<br>200         |
| 9,52..SP7 <sup>1)</sup>  | 9,52..SP7 <sup>2)</sup>  | 1           | 0.539<br>13,7             | 0.006<br>0,15            | 8        | 0.14<br>64     | 3 147<br>14,0      | 989<br>4,4     | 0.003<br>0,080      | 28.322<br>200         |

### 3.15 External thread rod end with integrated rolling bearing (inch dimensions)

CN.. bore code 6,35..4 to 6,35..10



|                                |                                                                                            |
|--------------------------------|--------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2067                                                                                    |
| <b>Product standard</b>        | EN 4156<br>(bearing in corrosion-resistant steel)<br>EN 4157<br>(bearing in bearing steel) |

#### Dimensions

| Nominal bore code | Dimensions d    | $\Delta d_{mp}$      | $\Delta d_s$         | D<br>$\pm 0.010$<br>$\pm 0,254$ | B<br>0/-0.005<br>0/-0,127 | C<br>$\pm 0.005$<br>$\pm 0,127$ | A<br>Min    | $d_1$<br>$\approx$ |
|-------------------|-----------------|----------------------|----------------------|---------------------------------|---------------------------|---------------------------------|-------------|--------------------|
| –                 | in/mm           |                      |                      |                                 |                           |                                 |             |                    |
| 6,35..4           | 0.2500<br>6,350 | 0/-0.003<br>0/-0,008 | 0/-0.005<br>0/-0,013 | 0.886<br>22,5                   | 0.551<br>14               | 0.394<br>10                     | 1.063<br>27 | 0.33<br>8,4        |
| 6,35..5           | 0.2500<br>6,350 | 0/-0.003<br>0/-0,008 | 0/-0.005<br>0/-0,013 | 0.886<br>22,5                   | 0.551<br>14               | 0.394<br>10                     | 1.457<br>37 | 0.33<br>8,4        |
| 6,35..6           | 0.2500<br>6,350 | 0/-0.003<br>0/-0,008 | 0/-0.005<br>0/-0,013 | 0.886<br>22,5                   | 0.551<br>14               | 0.394<br>10                     | 1.457<br>37 | 0.33<br>8,4        |
| 6,35..7           | 0.2500<br>6,350 | 0/-0.003<br>0/-0,008 | 0/-0.005<br>0/-0,013 | 0.886<br>22,5                   | 0.551<br>14               | 0.394<br>10                     | 1.654<br>42 | 0.33<br>8,4        |
| 6,35..8           | 0.2500<br>6,350 | 0/-0.003<br>0/-0,008 | 0/-0.005<br>0/-0,013 | 0.886<br>22,5                   | 0.551<br>14               | 0.394<br>10                     | 2.047<br>52 | 0.33<br>8,4        |
| 6,35..9           | 0.2500<br>6,350 | 0/-0.003<br>0/-0,008 | 0/-0.005<br>0/-0,013 | 0.886<br>22,5                   | 0.551<br>14               | 0.394<br>10                     | 2.323<br>59 | 0.33<br>8,4        |
| 6,35..10          | 0.2500<br>6,350 | 0/-0.003<br>0/-0,008 | 0/-0.005<br>0/-0,013 | 0.886<br>22,5                   | 0.551<br>14               | 0.394<br>10                     | 2.480<br>63 | 0.33<br>8,4        |

#### Dimensions cont.

| Nominal bore code | Dimensions H<br>UNJF-3A | V<br>$\pm 0.02$<br>$\pm 0,5$ | L<br>$\pm 0.010$<br>$\pm 0,25$ | M<br>$+0.005/0$<br>$+0,127/0$ | N<br>$+0.005/0$<br>$+0,127/0$ | r                    | $\alpha$ | Mass<br>$\approx$ |
|-------------------|-------------------------|------------------------------|--------------------------------|-------------------------------|-------------------------------|----------------------|----------|-------------------|
| –                 | –                       | in/mm                        |                                |                               |                               |                      | °        | lb/g              |
| 6,35..4           | 1/4-28<br>6,35-28       | 1.15<br>29,3                 | 2.126<br>54                    | 0.063<br>1,6                  | 0.202<br>5,11                 | 0.01/0.02<br>0,3/0,5 | 8        | 0.08<br>37        |
| 6,35..5           | 5/16-24<br>7,94-24      | 1.55<br>39,3                 | 2.126<br>54                    | 0.063<br>1,6                  | 0.260<br>6,6                  | 0.01/0.02<br>0,3/0,5 | 8        | 0.09<br>41        |
| 6,35..6           | 3/8-24<br>9,52-24       | 1.55<br>39,3                 | 2.126<br>54                    | 0.095<br>2,4                  | 0.311<br>7,9                  | 0.01/0.02<br>0,3/0,5 | 8        | 0.10<br>46        |
| 6,35..7           | 7/16-20<br>11,11-20     | 1.74<br>44,3                 | 2.362<br>60                    | 0.095<br>2,4                  | 0.370<br>9,4                  | 0.01/0.02<br>0,3/0,5 | 8        | 0.12<br>56        |
| 6,35..8           | 1/2-20<br>12,7-20       | 2.14<br>54,3                 | 3.051<br>77,5                  | 0.095<br>2,4                  | 0.436<br>11,07                | 0.01/0.02<br>0,3/0,5 | 8        | 0.16<br>73        |
| 6,35..9           | 9/16-18<br>14,29-18     | 2.41<br>61,3                 | 3.346<br>85                    | 0.126<br>3,2                  | 0.478<br>12,14                | 0.01/0.02<br>0,3/0,5 | 8        | 0.17<br>77        |
| 6,35..10          | 5/8-18<br>15,87-18      | 2.57<br>65,3                 | 3.150<br>80                    | 0.126<br>3,2                  | 0.539<br>13,7                 | 0.01/0.02<br>0,3/0,5 | 8        | 0.22<br>98        |

## Designation system

|                                       |                                                                                            |    |                     |      |   |   |   |   |     |
|---------------------------------------|--------------------------------------------------------------------------------------------|----|---------------------|------|---|---|---|---|-----|
| Examples:                             | ZXCN 6,35-6GKG81<br>CN 6,35E10                                                             | ZX | CN                  | 6,35 | - | 6 | G | K | G81 |
| <b>Material and surface treatment</b> |                                                                                            |    |                     |      |   |   |   |   |     |
| <b>Inner ring and ball</b>            |                                                                                            |    | <b>Rod end body</b> |      |   |   |   |   |     |
| No code                               | Bearing steel                                                                              |    |                     |      |   |   |   |   |     |
| S <sup>1)</sup>                       | Bearing steel                                                                              |    |                     |      |   |   |   |   |     |
| W                                     | Corrosion-resistant steel                                                                  |    |                     |      |   |   |   |   |     |
| SW <sup>1)</sup>                      | Corrosion-resistant steel                                                                  |    |                     |      |   |   |   |   |     |
| X <sup>1)</sup>                       | Corrosion-resistant steel                                                                  |    |                     |      |   |   |   |   |     |
| ZX <sup>1)</sup>                      | Corrosion-resistant steel                                                                  |    |                     |      |   |   |   |   |     |
| SZX <sup>1)</sup>                     | Corrosion-resistant steel                                                                  |    |                     |      |   |   |   |   |     |
| <b>Basic designation</b>              |                                                                                            |    |                     |      |   |   |   |   |     |
| <b>Bore code</b>                      |                                                                                            |    |                     |      |   |   |   |   |     |
| <b>Shield and seal</b>                |                                                                                            |    |                     |      |   |   |   |   |     |
| -                                     | Shielded                                                                                   |    |                     |      |   |   |   |   |     |
| E                                     | Sealed                                                                                     |    |                     |      |   |   |   |   |     |
| <b>Thread direction</b>               |                                                                                            |    |                     |      |   |   |   |   |     |
| No code                               | Right-hand thread                                                                          |    |                     |      |   |   |   |   |     |
| G                                     | Left-hand thread                                                                           |    |                     |      |   |   |   |   |     |
| <b>Keyway</b>                         |                                                                                            |    |                     |      |   |   |   |   |     |
| No code <sup>1)</sup>                 | Without keyway                                                                             |    |                     |      |   |   |   |   |     |
| K                                     | With keyway type 1, except for bore code 6,35..6 / 7,94..7 and 9,52..9, with keyway type 2 |    |                     |      |   |   |   |   |     |
| K2                                    | With keyway type 2, except for bore code 6,35..6 / 7,94..7 and 9,52..9, with keyway type 1 |    |                     |      |   |   |   |   |     |
| <b>Lubricant</b>                      |                                                                                            |    |                     |      |   |   |   |   |     |
| No code                               | Grease G354                                                                                |    |                     |      |   |   |   |   |     |
| G74                                   | Grease MIL PRF 23827 type II                                                               |    |                     |      |   |   |   |   |     |
| G81                                   | Grease G395                                                                                |    |                     |      |   |   |   |   |     |

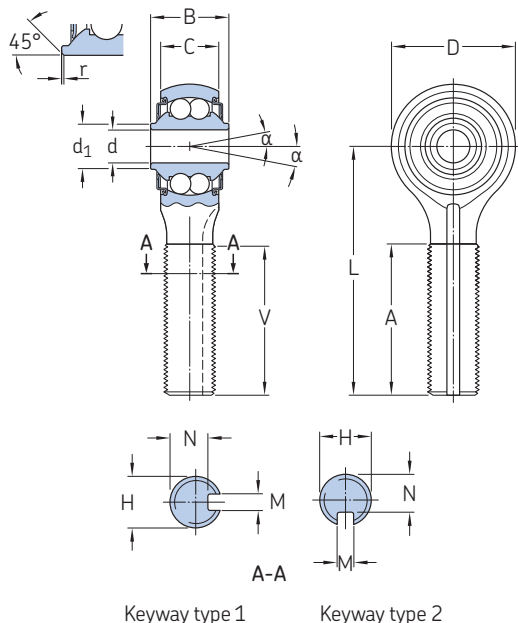
<sup>1)</sup> SKF option

## Loads, torque and clearance

| Nominal bore code | Limit static loads    |                      | Max. starting torque |              | Swivelling torque max | Internal Clearances           |                |
|-------------------|-----------------------|----------------------|----------------------|--------------|-----------------------|-------------------------------|----------------|
|                   | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Shielded             | Sealed       |                       | Radial                        | Axial max      |
| –                 | lbf/kN                |                      | oz.in/mN.m           |              |                       | in/mm                         |                |
| 6,35..4           | 1 531<br>6,810        | 478<br>2,126         | 0.283<br>2,0         | 0.566<br>4,0 | 21.242<br>150         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| 6,35..5           | 1 531<br>6,810        | 478<br>2,126         | 0.283<br>2,0         | 0.566<br>4,0 | 21.242<br>150         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| 6,35..6           | 1 531<br>6,810        | 478<br>2,126         | 0.283<br>2,0         | 0.566<br>4,0 | 21.242<br>150         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| 6,35..7           | 1 531<br>6,810        | 478<br>2,126         | 0.283<br>2,0         | 0.566<br>4,0 | 21.242<br>150         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| 6,35..8           | 1 531<br>6,810        | 478<br>2,126         | 0.283<br>2,0         | 0.566<br>4,0 | 21.242<br>150         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| 6,35..9           | 1 531<br>6,810        | 478<br>2,126         | 0.283<br>2,0         | 0.566<br>4,0 | 21.242<br>150         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| 6,35..10          | 1 531<br>6,810        | 478<br>2,126         | 0.283<br>2,0         | 0.566<br>4,0 | 21.242<br>150         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |

### 3.15 External thread rod end with integrated rolling bearing (inch dimensions)

CN.. bore code 7,94..5 to 7,94..10



|                                |                                                                                            |
|--------------------------------|--------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2067                                                                                    |
| <b>Product standard</b>        | EN 4156<br>(bearing in corrosion-resistant steel)<br>EN 4157<br>(bearing in bearing steel) |

#### Dimensions

| Nominal bore code | Dimensions d    | $\Delta d_{mp}$          | $\Delta d_s$             | D<br>$\pm 0.010$<br>$\pm 0,254$ | B<br>$0/-0.005$<br>$0/-0,127$ | C<br>$\pm 0.005$<br>$\pm 0,127$ | A<br>Min    | $d_1$<br>$\approx$ |
|-------------------|-----------------|--------------------------|--------------------------|---------------------------------|-------------------------------|---------------------------------|-------------|--------------------|
| –                 | in/mm           |                          |                          |                                 |                               |                                 |             |                    |
| <b>7,94..5</b>    | 0.3125<br>7,938 | $0/-0.003$<br>$0/-0,008$ | $0/-0.005$<br>$0/-0,013$ | 1.122<br>28,5                   | 0.591<br>15                   | 0.394<br>10                     | 1.457<br>37 | 0.43<br>10,8       |
| <b>7,94..6</b>    | 0.3125<br>7,938 | $0/-0.003$<br>$0/-0,008$ | $0/-0.005$<br>$0/-0,013$ | 1.122<br>28,5                   | 0.591<br>15                   | 0.394<br>10                     | 1.457<br>37 | 0.43<br>10,8       |
| <b>7,94..7</b>    | 0.3125<br>7,938 | $0/-0.003$<br>$0/-0,008$ | $0/-0.005$<br>$0/-0,013$ | 1.122<br>28,5                   | 0.591<br>15                   | 0.394<br>10                     | 1.654<br>42 | 0.43<br>10,8       |
| <b>7,94..8</b>    | 0.3125<br>7,938 | $0/-0.003$<br>$0/-0,008$ | $0/-0.005$<br>$0/-0,013$ | 1.122<br>28,5                   | 0.591<br>15                   | 0.394<br>10                     | 2.047<br>52 | 0.43<br>10,8       |
| <b>7,94..9</b>    | 0.3125<br>7,938 | $0/-0.003$<br>$0/-0,008$ | $0/-0.005$<br>$0/-0,013$ | 1.122<br>28,5                   | 0.591<br>15                   | 0.394<br>10                     | 2.323<br>59 | 0.43<br>10,8       |
| <b>7,94..10</b>   | 0.3125<br>7,938 | $0/-0.003$<br>$0/-0,008$ | $0/-0.005$<br>$0/-0,013$ | 1.122<br>28,5                   | 0.591<br>15                   | 0.394<br>10                     | 2.480<br>63 | 0.54<br>13,8       |

#### Dimensions cont.

| Nominal bore code | Dimensions H<br>UNJF-3A | V<br>$\pm 0.02$<br>$\pm 0,5$ | L<br>$\pm 0.010$<br>$\pm 0,25$ | M<br>$+0.005/0$<br>$+0,127/0$ | N<br>$+0.005/0$<br>$+0,127/0$ | r                    | $\alpha$ | Mass<br>$\approx$ |
|-------------------|-------------------------|------------------------------|--------------------------------|-------------------------------|-------------------------------|----------------------|----------|-------------------|
| –                 | –                       | in/mm                        |                                |                               |                               |                      | °        | lb/g              |
| <b>7,94..5</b>    | 5/16-24<br>7,94-24      | 1.55<br>39,3                 | 2.362<br>60                    | 0.063<br>1,6                  | 0.260<br>6,6                  | 0.01/0.03<br>0,3/0,8 | 8        | 0.13<br>60        |
| <b>7,94..6</b>    | 3/8-24<br>9,52-24       | 1.55<br>39,3                 | 2.362<br>60                    | 0.095<br>2,4                  | 0.311<br>7,9                  | 0.01/0.03<br>0,3/0,8 | 8        | 0.14<br>64        |
| <b>7,94..7</b>    | 7/16-20<br>11,11-20     | 1.74<br>44,3                 | 2.441<br>62                    | 0.095<br>2,4                  | 0.370<br>9,4                  | 0.01/0.03<br>0,3/0,8 | 8        | 0.16<br>71        |
| <b>7,94..8</b>    | 1/2-20<br>12,7-20       | 2.14<br>54,3                 | 2.913<br>74                    | 0.095<br>2,4                  | 0.436<br>11,07                | 0.01/0.03<br>0,3/0,8 | 8        | 0.19<br>86        |
| <b>7,94..9</b>    | 9/16-18<br>14,29-18     | 2.41<br>61,3                 | 3.150<br>80                    | 0.126<br>3,2                  | 0.478<br>12,14                | 0.01/0.03<br>0,3/0,8 | 8        | 0.23<br>103       |
| <b>7,94..10</b>   | 5/8-18<br>15,87-18      | 2.57<br>65,3                 | 3.268<br>83                    | 0.126<br>3,2                  | 0.539<br>13,7                 | 0.01/0.03<br>0,3/0,8 | 8        | 0.25<br>114       |

## Designation system

|                                       |                                                                                            |                                              |    |      |   |   |   |   |     |
|---------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------|----|------|---|---|---|---|-----|
| Examples:                             | ZXCN 6,35-6GKG81<br>CN 6,35E10                                                             | ZX                                           | CN | 6,35 | - | 6 | G | K | G81 |
| <b>Material and surface treatment</b> |                                                                                            |                                              |    |      |   |   |   |   |     |
|                                       | <b>Inner ring and ball</b>                                                                 | <b>Rod end body</b>                          |    |      |   |   |   |   |     |
| No code                               | Bearing steel                                                                              | Cadmium plated steel                         |    |      |   |   |   |   |     |
| S <sup>1)</sup>                       | Bearing steel                                                                              | Zinc-nickel plated steel                     |    |      |   |   |   |   |     |
| W                                     | Corrosion-resistant steel                                                                  | Cadmium plated steel                         |    |      |   |   |   |   |     |
| SW <sup>1)</sup>                      | Corrosion-resistant steel                                                                  | Zinc-nickel plated steel                     |    |      |   |   |   |   |     |
| X <sup>1)</sup>                       | Corrosion-resistant steel                                                                  | Corrosion-resistant steel                    |    |      |   |   |   |   |     |
| ZX <sup>1)</sup>                      | Corrosion-resistant steel                                                                  | Cadmium plated corrosion-resistant steel     |    |      |   |   |   |   |     |
| SZX <sup>1)</sup>                     | Corrosion-resistant steel                                                                  | Zinc-nickel plated corrosion-resistant steel |    |      |   |   |   |   |     |
| <b>Basic designation</b>              |                                                                                            |                                              |    |      |   |   |   |   |     |
| <b>Bore code</b>                      |                                                                                            |                                              |    |      |   |   |   |   |     |
| <b>Shield and seal</b>                |                                                                                            |                                              |    |      |   |   |   |   |     |
| -                                     | Shielded                                                                                   |                                              |    |      |   |   |   |   |     |
| E                                     | Sealed                                                                                     |                                              |    |      |   |   |   |   |     |
| <b>Thread direction</b>               |                                                                                            |                                              |    |      |   |   |   |   |     |
| No code                               | Right-hand thread                                                                          |                                              |    |      |   |   |   |   |     |
| G                                     | Left-hand thread                                                                           |                                              |    |      |   |   |   |   |     |
| <b>Keyway</b>                         |                                                                                            |                                              |    |      |   |   |   |   |     |
| No code <sup>1)</sup>                 | Without keyway                                                                             |                                              |    |      |   |   |   |   |     |
| K                                     | With keyway type 1, except for bore code 6,35..6 / 7,94..7 and 9,52..9, with keyway type 2 |                                              |    |      |   |   |   |   |     |
| K2                                    | With keyway type 2, except for bore code 6,35..6 / 7,94..7 and 9,52..9, with keyway type 1 |                                              |    |      |   |   |   |   |     |
| <b>Lubricant</b>                      |                                                                                            |                                              |    |      |   |   |   |   |     |
| No code                               | Grease G354                                                                                |                                              |    |      |   |   |   |   |     |
| G74                                   | Grease MIL PRF 23827 type II                                                               |                                              |    |      |   |   |   |   |     |
| G81                                   | Grease G395                                                                                |                                              |    |      |   |   |   |   |     |

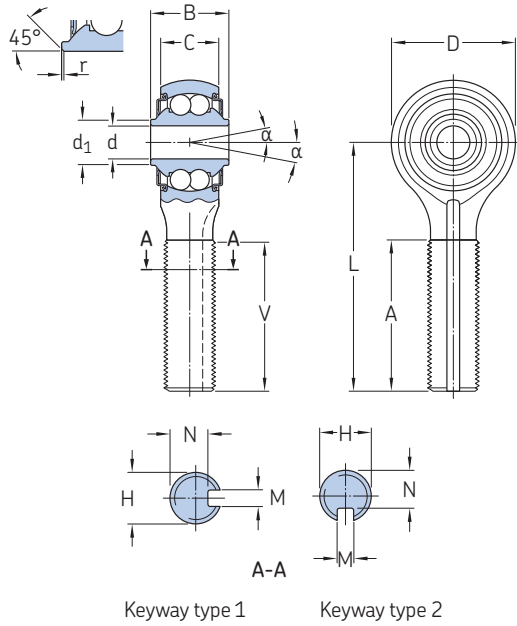
<sup>1)</sup> SKF option

## Loads, torque and clearance

| Nominal bore code | Limit static loads    |                      | Max. starting torque |               | Swivelling torque max | Internal Clearances           |                |
|-------------------|-----------------------|----------------------|----------------------|---------------|-----------------------|-------------------------------|----------------|
|                   | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Shielded             | Sealed        |                       | Radial                        | Axial max      |
| –                 | lbf/kN                |                      | oz.in/mN.m           |               |                       | in/mm                         |                |
| <b>7,94..5</b>    | 2 424<br>10,8         | 764<br>3,4           | 0.708<br>5,0         | 1.416<br>10,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>7,94..6</b>    | 2 424<br>10,8         | 764<br>3,4           | 0.708<br>5,0         | 1.416<br>10,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>7,94..7</b>    | 2 424<br>10,8         | 764<br>3,4           | 0.708<br>5,0         | 1.416<br>10,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>7,94..8</b>    | 2 424<br>10,8         | 764<br>3,4           | 0.708<br>5,0         | 1.416<br>10,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>7,94..9</b>    | 2 424<br>10,8         | 764<br>3,4           | 0.708<br>5,0         | 1.416<br>10,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>7,94..10</b>   | 2 424<br>10,8         | 764<br>3,4           | 0.708<br>5,0         | 1.416<br>10,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |

### 3.15 External thread rod end with integrated rolling bearing (inch dimensions)

CN.. bore code 9,52..6 to 9,52..10



|                                |                                                                                            |
|--------------------------------|--------------------------------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2067                                                                                    |
| <b>Product standard</b>        | EN 4156<br>(bearing in corrosion-resistant steel)<br>EN 4157<br>(bearing in bearing steel) |

#### Dimensions

| Nominal bore code | Dimensions d    | $\Delta d_{mp}$      | $\Delta d_s$         | D<br>$\pm 0.010$<br>$\pm 0.254$ | B<br>$0/-0.005$<br>$0/-0.127$ | C<br>$\pm 0.005$<br>$\pm 0.127$ | A<br>Min    | $d_1$<br>$\approx$ |
|-------------------|-----------------|----------------------|----------------------|---------------------------------|-------------------------------|---------------------------------|-------------|--------------------|
| –                 | in/mm           |                      |                      |                                 |                               |                                 |             |                    |
| 9,52..6           | 0.3750<br>9,525 | 0/-0.003<br>0/-0.008 | 0/-0.005<br>0/-0.013 | 1.260<br>32                     | 0.787<br>20                   | 0.551<br>14                     | 1.457<br>37 | 0.54<br>13,8       |
| 9,52..7           | 0.3750<br>9,525 | 0/-0.003<br>0/-0.008 | 0/-0.005<br>0/-0.013 | 1.260<br>32                     | 0.787<br>20                   | 0.551<br>14                     | 1.654<br>42 | 0.54<br>13,8       |
| 9,52..8           | 0.3750<br>9,525 | 0/-0.003<br>0/-0.008 | 0/-0.005<br>0/-0.013 | 1.260<br>32                     | 0.787<br>20                   | 0.551<br>14                     | 2.047<br>52 | 0.54<br>13,8       |
| 9,52..9           | 0.3750<br>9,525 | 0/-0.003<br>0/-0.008 | 0/-0.005<br>0/-0.013 | 1.260<br>32                     | 0.787<br>20                   | 0.551<br>14                     | 1.890<br>48 | 0.54<br>13,8       |
| 9,52..10          | 0.3750<br>9,525 | 0/-0.003<br>0/-0.008 | 0/-0.005<br>0/-0.013 | 1.260<br>32                     | 0.787<br>20                   | 0.551<br>14                     | 2.480<br>63 | 0.54<br>13,8       |

#### Dimensions cont.

| Nominal bore code | Dimensions H<br>UNJF-3A | V<br>$\pm 0.02$<br>$\pm 0.5$ | L<br>$\pm 0.010$<br>$\pm 0.25$ | M<br>$+0.005/0$<br>$+0.127/0$ | N<br>$+0.005/0$<br>$+0.127/0$ | r                    | $\alpha$ | Mass<br>$\approx$ |
|-------------------|-------------------------|------------------------------|--------------------------------|-------------------------------|-------------------------------|----------------------|----------|-------------------|
| –                 | –                       | in/mm                        |                                |                               |                               |                      | °        | lb/g              |
| 9,52..6           | 3/8-24<br>9,52-24       | 1.55<br>39,3                 | 2.441<br>62                    | 0.095<br>2,4                  | 0.311<br>7,9                  | 0.01/0.03<br>0,3/0,8 | 8        | 0.21<br>94        |
| 9,52..7           | 7/16-20<br>11,11-20     | 1.74<br>44,3                 | 2.638<br>67                    | 0.095<br>2,4                  | 0.370<br>9,4                  | 0.01/0.03<br>0,3/0,8 | 8        | 0.23<br>106       |
| 9,52..8           | 1/2-20<br>12,7-20       | 2.14<br>54,3                 | 2.953<br>75                    | 0.095<br>2,4                  | 0.436<br>11,07                | 0.01/0.03<br>0,3/0,8 | 8        | 0.27<br>122       |
| 9,52..9           | 9/16-18<br>14,29-18     | 1.98<br>50,3                 | 2.874<br>73                    | 0.126<br>3,2                  | 0.478<br>12,14                | 0.01/0.03<br>0,3/0,8 | 8        | 0.29<br>132       |
| 9,52..10          | 5/8-18<br>15,87-18      | 2.57<br>65,3                 | 3.346<br>85                    | 0.126<br>3,2                  | 0.539<br>13,7                 | 0.01/0.03<br>0,3/0,8 | 8        | 0.317<br>144      |



## Designation system

|                                       |                                                                                            |                                              |    |      |   |   |   |   |     |
|---------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------|----|------|---|---|---|---|-----|
| Examples:                             | ZXCN 6,35-6GKG81<br>CN 6,35E10                                                             | ZX                                           | CN | 6,35 | - | 6 | G | K | G81 |
| <b>Material and surface treatment</b> |                                                                                            |                                              |    |      |   |   |   |   |     |
|                                       | <b>Inner ring and ball</b>                                                                 | <b>Rod end body</b>                          |    |      |   |   |   |   |     |
| No code                               | Bearing steel                                                                              | Cadmium plated steel                         |    |      |   |   |   |   |     |
| S <sup>1)</sup>                       | Bearing steel                                                                              | Zinc-nickel plated steel                     |    |      |   |   |   |   |     |
| W                                     | Corrosion-resistant steel                                                                  | Cadmium plated steel                         |    |      |   |   |   |   |     |
| SW <sup>1)</sup>                      | Corrosion-resistant steel                                                                  | Zinc-nickel plated steel                     |    |      |   |   |   |   |     |
| X <sup>1)</sup>                       | Corrosion-resistant steel                                                                  | Corrosion-resistant steel                    |    |      |   |   |   |   |     |
| ZX <sup>1)</sup>                      | Corrosion-resistant steel                                                                  | Cadmium plated corrosion-resistant steel     |    |      |   |   |   |   |     |
| SZX <sup>1)</sup>                     | Corrosion-resistant steel                                                                  | Zinc-nickel plated corrosion-resistant steel |    |      |   |   |   |   |     |
| <b>Basic designation</b>              |                                                                                            |                                              |    |      |   |   |   |   |     |
| <b>Bore code</b>                      |                                                                                            |                                              |    |      |   |   |   |   |     |
| <b>Shield and seal</b>                |                                                                                            |                                              |    |      |   |   |   |   |     |
| -                                     | Shielded                                                                                   |                                              |    |      |   |   |   |   |     |
| E                                     | Sealed                                                                                     |                                              |    |      |   |   |   |   |     |
| <b>Thread direction</b>               |                                                                                            |                                              |    |      |   |   |   |   |     |
| No code                               | Right-hand thread                                                                          |                                              |    |      |   |   |   |   |     |
| G                                     | Left-hand thread                                                                           |                                              |    |      |   |   |   |   |     |
| <b>Keyway</b>                         |                                                                                            |                                              |    |      |   |   |   |   |     |
| No code <sup>1)</sup>                 | Without keyway                                                                             |                                              |    |      |   |   |   |   |     |
| K                                     | With keyway type 1, except for bore code 6,35..6 / 7,94..7 and 9,52..9, with keyway type 2 |                                              |    |      |   |   |   |   |     |
| K2                                    | With keyway type 2, except for bore code 6,35..6 / 7,94..7 and 9,52..9, with keyway type 1 |                                              |    |      |   |   |   |   |     |
| <b>Lubricant</b>                      |                                                                                            |                                              |    |      |   |   |   |   |     |
| No code                               | Grease G354                                                                                |                                              |    |      |   |   |   |   |     |
| G74                                   | Grease MIL PRF 23827 type II                                                               |                                              |    |      |   |   |   |   |     |
| G81                                   | Grease G395                                                                                |                                              |    |      |   |   |   |   |     |

1) SKF option

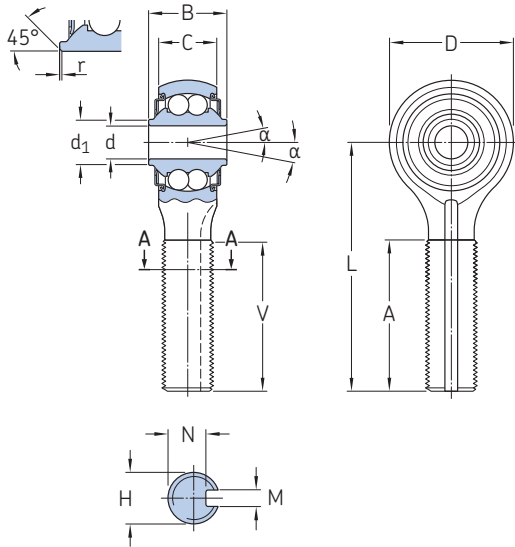
## Loads, torque and clearance

| Nominal bore code | Limit static loads    |                      | Max. starting torque |               | Swivelling torque max | Internal Clearances           |                |
|-------------------|-----------------------|----------------------|----------------------|---------------|-----------------------|-------------------------------|----------------|
|                   | Radial C <sub>s</sub> | Axial C <sub>a</sub> | Shielded             | Sealed        |                       | Radial                        | Axial max      |
| –                 | lbf/kN                |                      | oz.in/mN.m           |               |                       | in/mm                         |                |
| <b>9,52..6</b>    | 3 147<br>14,0         | 989<br>4,4           | 0,991<br>7,0         | 1,699<br>12,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>9,52..7</b>    | 3 147<br>14,0         | 989<br>4,4           | 0,991<br>7,0         | 1,699<br>12,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>9,52..8</b>    | 3 147<br>14,0         | 989<br>4,4           | 0,991<br>7,0         | 1,699<br>12,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>9,52..9</b>    | 3 147<br>14,0         | 989<br>4,4           | 0,991<br>7,0         | 1,699<br>12,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |
| <b>9,52..10</b>   | 3 147<br>14,0         | 989<br>4,4           | 0,991<br>7,0         | 1,699<br>12,0 | 28.322<br>200         | 0.00004/0.0002<br>0,001/0,005 | 0.003<br>0,080 |

### 3.16 External thread rod end with integrated rolling bearing (inch dimensions)

REP..M, RA..M, RAP..M

|                         |          |
|-------------------------|----------|
| Technical specification | AS 6039  |
| Product standard        | AS 21151 |



3.16



#### Dimensions

| Nominal bore code        |                                                         | Dimensions            |                  |                      |                  |                  |                   |                |                       |         |
|--------------------------|---------------------------------------------------------|-----------------------|------------------|----------------------|------------------|------------------|-------------------|----------------|-----------------------|---------|
| Without keyway           | With keyway                                             | d                     | D                | B                    | C                | A                | V                 | d <sub>1</sub> | r                     | H       |
|                          |                                                         | 0/-0.0003<br>0/-0.008 | ±0.010<br>±0.254 | 0/-0.005<br>0/-0.127 | ±0.010<br>±0.254 | ±0.031<br>±0.787 | +0.02/0<br>+0.5/0 | ≈              | +0.015/0<br>+ 0.381/0 | UNJF-3A |
| —                        |                                                         | in/mm                 |                  |                      |                  |                  |                   |                |                       |         |
| REP 3M..3                | —                                                       | 0.1900<br>4,826       | 0.781<br>19,837  | 0.437<br>11,100      | 0.328<br>8,331   | 0.750<br>19,05   | 0.750<br>19,05    | 0.276<br>7,01  | 0.005<br>0,127        | 10-32   |
| REP 3M..5                | —                                                       | 0.1900<br>4,826       | 0.781<br>19,837  | 0.437<br>11,100      | 0.328<br>8,331   | 0.750<br>19,05   | 0.750<br>19,05    | 0.276<br>7,01  | 0.005<br>0,127        | 3/16-32 |
| REP 3M..4-6              | REP 3M..S4-6                                            | 0.1900<br>4,826       | 0.781<br>19,837  | 0.437<br>11,100      | 0.328<br>8,331   | 1.000<br>25,40   | 1.000<br>25,40    | 0.276<br>7,01  | 0.005<br>0,127        | 1/4-28  |
| REP 3M..6-2N             | REP 3MS..6-2N <sup>2)</sup><br>REP 3M..S6 <sup>3)</sup> | 0.1900<br>4,826       | 0.781<br>19,837  | 0.437<br>11,100      | 0.328<br>8,331   | 0.750<br>19,05   | 0.750<br>19,05    | 0.276<br>7,01  | 0.005<br>0,127        | 3/8-24  |
| RAP 3M..4-2              | RAP 3M..S4-2                                            | 0.1900<br>4,826       | 0.781<br>19,837  | 0.500<br>12,700      | 0.438<br>11,125  | 0.938<br>23,825  | 0.938<br>23,825   | 0.307<br>7,80  | 0.005<br>0,127        | 1/4-28  |
| —                        | RA 3M..5 <sup>1)</sup>                                  | 0.1900<br>4,826       | 0.781<br>19,837  | 0.562<br>14,275      | 0.438<br>11,125  | 1.375<br>34,925  | 1.375<br>34,925   | 0.307<br>7,80  | 0.005<br>0,127        | 5/16-24 |
| REP 3M..6A               | REP 3M..S6A                                             | 0.1900<br>4,826       | 0.969<br>24,613  | 0.500<br>12,700      | 0.407<br>10,338  | 1.313<br>33,350  | 1.313<br>33,350   | 0.299<br>7,59  | 0.005<br>0,127        | 3/8-24  |
| REP 4M..6                | REP 4M..6-4                                             | 0.2500<br>6,350       | 0.938<br>23,825  | 0.593<br>15,062      | 0.438<br>11,125  | 1.125<br>28,575  | 1.125<br>28,575   | 0.340<br>8,64  | 0.005<br>0,127        | 3/8-24  |
| —                        | RA 4M..7 <sup>1)</sup>                                  | 0.2500<br>6,350       | 0.938<br>23,825  | 0.687<br>17,450      | 0.531<br>13,487  | 1.625<br>41,275  | 1.625<br>41,275   | 0.430<br>10,92 | 0.005<br>0,127        | 7/16-20 |
| REP 5M..6                | REP 5M..6-2                                             | 0.3125<br>7,938       | 1.250<br>31,750  | 0.870<br>22,100      | 0.656<br>16,662  | 1.563<br>39,700  | 1.563<br>39,700   | 0.501<br>12,73 | 0.015<br>0,381        | 3/8-24  |
| REP 5M..7                | REP 5M..S7                                              | 0.3125<br>7,938       | 1.250<br>31,750  | 0.870<br>22,100      | 0.656<br>16,662  | 1.563<br>39,700  | 1.563<br>39,700   | 0.501<br>12,73 | 0.015<br>0,381        | 7/16-20 |
| REP 5M..10               | REP 5M..S10                                             | 0.3125<br>7,938       | 1.250<br>31,750  | 0.870<br>22,100      | 0.656<br>16,662  | 1.563<br>39,700  | 1.563<br>39,700   | 0.501<br>12,73 | 0.015<br>0,381        | 5/8-18  |
| REP 8M..10 <sup>1)</sup> | —                                                       | 0.5000<br>12,700      | 1.875<br>47,625  | 1.000<br>25,400      | 0.844<br>21,438  | 1.750<br>44,450  | 1.750<br>44,450   | 0.775<br>19,68 | 0.015<br>0,381        | 5/8-18  |
| RAP10M..10               | RAP10M..S10                                             | 0.6250<br>0,6250      | 2.000<br>2,000   | 1.125<br>1,125       | 0.938<br>0,938   | 1.500<br>1,500   | 1.500<br>1,500    | 0.875<br>22,23 | 0.015<br>0,381        | 5/8-18  |

<sup>1)</sup> SKF option   <sup>2)</sup> For right-hand thread   <sup>3)</sup> For left-hand thread

## Designation system

Examples: XREP 4ML6-4S181CP199  
RA 3M5SK1

X REP 4M L 6-4 S181 CP199

### Material and surface treatment

| No code          | Inner ring and ball       | Rod end body              |
|------------------|---------------------------|---------------------------|
| S                | Bearing steel             | Cadmium plated steel      |
| W <sup>1)</sup>  | Bearing steel             | Zinc-nickel plated steel  |
| SW <sup>1)</sup> | Corrosion-resistant steel | Cadmium plated steel      |
| X <sup>1)</sup>  | Corrosion-resistant steel | Zinc-nickel plated steel  |
|                  |                           | Corrosion-resistant steel |

### Basic designation

#### Thread direction

|                       |                   |
|-----------------------|-------------------|
| No code <sup>2)</sup> | Right-hand thread |
| R <sup>3)</sup>       | Right-hand thread |
| L                     | Left-hand thread  |

#### Lubricant

|      |             |
|------|-------------|
| SK1  | Grease G354 |
| S181 | Grease G395 |

#### Shield and seal

|                     |          |
|---------------------|----------|
| No code             | Sealed   |
| CP199 <sup>1)</sup> | Shielded |

<sup>1)</sup> SKF option

<sup>2)</sup> For bore codes other than REP3..3

<sup>3)</sup> For bore code REP3..3

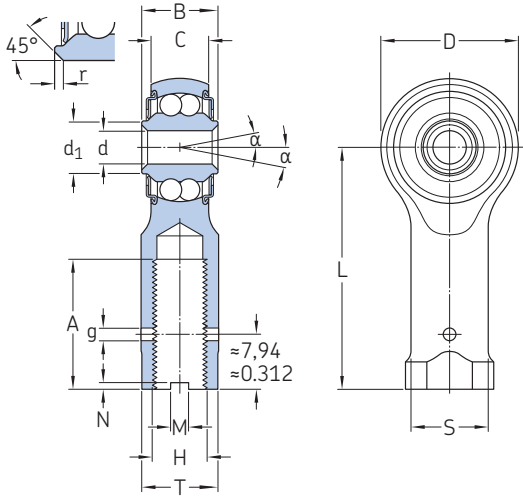
## Dimensions cont. loads, torque and clearance

| Nominal bore code        |                                                         | Dimensions            |                            |                           | $\alpha$ | Mass<br>≈    | Limit static loads       |                         | Max internal Clearances |                 | Max. starting torque |
|--------------------------|---------------------------------------------------------|-----------------------|----------------------------|---------------------------|----------|--------------|--------------------------|-------------------------|-------------------------|-----------------|----------------------|
| Without keyway           | With keyway                                             | L<br>±0.010<br>±0,254 | M<br>+0.005/0<br>+ 0,127/0 | N<br>0/-0.005<br>0/-0,127 |          |              | Radial<br>C <sub>s</sub> | Axial<br>C <sub>a</sub> | Radial                  | Axial           |                      |
| –                        | –                                                       | in/mm                 |                            |                           | °        | lb/g         | lbf/kN                   |                         | in/mm                   |                 | oz.in/mN.m           |
| REP 3M..3                | –                                                       | 1.375<br>34,925       | –                          | –                         | 10       | 0.04<br>18   | 1 000<br>4,4             | 200<br>0,89             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 3<br>21,18           |
| REP 3M..5                | –                                                       | 1.375<br>34,925       | –                          | –                         | 10       | 0.04<br>18   | 1 000<br>4,4             | 200<br>0,89             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 3<br>21,18           |
| REP 3M..4-6              | REP 3M..S4-6                                            | 1.563<br>39,700       | 0.062<br>1,574             | 0.20<br>5,105             | 10       | 0.05<br>23   | 1 000<br>4,4             | 200<br>0,89             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 3<br>21,18           |
| REP 3M..6-2N             | REP 3MS..6-2N <sup>2)</sup><br>REP 3M..S6 <sup>3)</sup> | 1.375<br>34,925       | 0.093<br>2,362             | 0.311<br>7,89             | 10       | 0.05<br>23   | 1 000<br>4,4             | 200<br>0,89             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 3<br>21,18           |
| RAP 3M..4-2              | RAP 3M..S4-2                                            | 1.812<br>46,025       | 0.062<br>1,574             | 0.20<br>5,105             | 10       | 0.10<br>45   | 1 000<br>4,4             | 200<br>0,89             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 3<br>21,18           |
| –                        | RA 3M..5 <sup>1)</sup>                                  | 1.938<br>49,225       | 0.062<br>1,574             | 0.260<br>6,60             | 10       | 0.07<br>32   | 1 000<br>4,4             | 240<br>1,07             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 3<br>21,18           |
| REP 3M..6A               | REP 3M..S6A                                             | 2.031<br>51,587       | 0.093<br>2,362             | 0.311<br>7,899            | 10       | 0.115<br>52  | 1 200<br>5,3             | 240<br>1,07             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 3<br>21,18           |
| REP 4M..6                | REP 4M..6-4                                             | 1.875<br>47,625       | 0.093<br>2,362             | 0.311<br>7,899            | 10       | 0.10<br>45   | 1 720<br>7,65            | 345<br>1,53             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 4<br>28,24           |
| –                        | RA 4M..7 <sup>1)</sup>                                  | 2.250<br>57,150       | 0.093<br>2,362             | 0.370<br>9,328            | 10       | 0.13<br>59   | 1 720<br>7,65            | 345<br>1,53             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 4<br>28,24           |
| REP 5M..6                | REP 5M..6-2                                             | 2.438<br>61,925       | 0.093<br>2,362             | 0.311<br>7,899            | 10       | 0.24<br>109  | 2 920<br>12,99           | 585<br>2,60             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 6<br>42,36           |
| REP 5M..7                | REP 5M..S7                                              | 2.438<br>61,925       | 0.093<br>2,362             | 0.370<br>9,328            | 10       | 0.24<br>109  | 2 920<br>12,99           | 585<br>2,60             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 6<br>42,36           |
| REP 5M..10               | REP 5M..S10                                             | 2.438<br>61,925       | 0.125<br>3,175             | 0.541<br>13,741           | 10       | 0.24<br>109  | 2 920<br>12,99           | 585<br>2,60             | 0.0004<br>0,0101        | 0.003<br>0,0762 | 6<br>42,36           |
| REP 8M..10 <sup>1)</sup> | –                                                       | 3.031<br>76,987       | –                          | –                         | 10       | 0.55<br>249  | 6 900<br>30,69           | 1 380<br>6,14           | 0.0004<br>0,0101        | 0.003<br>0,0762 | 8<br>56,48           |
| RAP10M..10               | RAP10M..S10                                             | 2.750<br>2,750        | 0.125<br>3,175             | 0.541<br>13,741           | 10       | 0.71<br>0,71 | 7 090<br>31,54           | 1 420<br>6,32           | 0.0004<br>0,0101        | 0.003<br>0,0762 | 8<br>56,48           |

### 3.17 Internal thread rod end with integrated rolling bearing (inch dimensions)

REP, REP..F., REPB..N..

|                         |          |
|-------------------------|----------|
| Technical specification | AS 6039  |
| Product standard        | AS 21153 |



#### Dimensions

| Nominal<br>bore<br>code                      | Dimensions                 |                       |                           |                       |                      |                           |               |                     |              |                       |                       |
|----------------------------------------------|----------------------------|-----------------------|---------------------------|-----------------------|----------------------|---------------------------|---------------|---------------------|--------------|-----------------------|-----------------------|
|                                              | d<br>0/-0.0003<br>0/-0,008 | D<br>±0.010<br>±0,254 | B<br>0/-0.005<br>0/-0,127 | C<br>±0.010<br>±0,254 | A<br>±0.031<br>±0,79 | r<br>+0.015/0<br>+0,381/0 | g<br>=        | d <sub>1</sub><br>≈ | H<br>UNJF-3B | L<br>±0.010<br>±0,254 | S<br>±0.010<br>±0,254 |
| —                                            | in/mm                      |                       |                           |                       |                      |                           |               |                     | —            | in/mm                 |                       |
| B 3N <sup>1)</sup><br>3F...4-3 <sup>2)</sup> | 0.1900<br>4,826            | 0.781<br>19,837       | 0.437<br>11,100           | 0.328<br>8,331        | 0.812<br>20,625      | 0.005<br>0,127            | 0.07<br>1,778 | 0.276<br>7,01       | 1/4-28       | 1.375<br>34,925       | 0.375<br>9,525        |
| B 3N-2                                       | 0.1900<br>4,826            | 0.781<br>19,837       | 0.437<br>11,100           | 0.328<br>8,331        | 0.812<br>20,625      | 0.005<br>0,127            | 0.07<br>1,778 | 0.276<br>7,01       | 5/16-24      | 1.375<br>34,925       | 0.438<br>11,125       |
| 3F..4                                        | 0.1900<br>4,826            | 0.781<br>19,837       | 0.500<br>12,700           | 0.328<br>8,331        | 0.812<br>20,625      | 0.005<br>0,127            | 0.07<br>1,778 | 0.276<br>7,01       | 1/4-28       | 1.375<br>34,925       | 0.375<br>9,525        |
| 4F..5                                        | 0.2500<br>6,350            | 0.938<br>23,825       | 0.593<br>15,062           | 0.438<br>11,125       | 0.812<br>20,625      | 0.005<br>0,127            | 0.07<br>1,778 | 0.340<br>8,63       | 5/16-24      | 1.469<br>37,313       | 0.438<br>11,125       |
| 4F..7                                        | 0.2500<br>6,350            | 0.938<br>23,825       | 0.593<br>15,062           | 0.438<br>11,125       | 1.125<br>28,575      | 0.015<br>0,381            | 0.07<br>1,778 | 0.340<br>8,63       | 7/16-20      | 1.875<br>47,625       | 0.625<br>15,875       |
| 5F..5                                        | 0.3125<br>7,938            | 1.250<br>31,750       | 0.870<br>22,100           | 0.656<br>16,662       | 1.000<br>25,400      | 0.015<br>0,381            | 0.07<br>1,778 | 0.501<br>12,72      | 5/16-24      | 1.875<br>47,625       | 0.438<br>11,125       |

<sup>1)</sup> For right-hand thread

<sup>2)</sup> For left-hand thread

## Designation system

|                                       |                            |                           |   |     |   |   |   |   |   |      |       |
|---------------------------------------|----------------------------|---------------------------|---|-----|---|---|---|---|---|------|-------|
| Examples:                             | XREP 4FL5KS181CP199        |                           | X | REP | 4 | F | L | 5 | K | S181 | CP199 |
|                                       | REPB 3NSK1                 |                           |   |     |   |   |   |   |   |      |       |
| <b>Material and surface treatment</b> |                            |                           |   |     |   |   |   |   |   |      |       |
|                                       | <b>Inner ring and ball</b> | <b>Rod end body</b>       |   |     |   |   |   |   |   |      |       |
| No code                               | Bearing steel              | Cadmium plated steel      |   |     |   |   |   |   |   |      |       |
| S                                     | Bearing steel              | Zinc-nickel plated steel  |   |     |   |   |   |   |   |      |       |
| W <sup>3)</sup>                       | Corrosion-resistant steel  | Cadmium plated steel      |   |     |   |   |   |   |   |      |       |
| SW <sup>3)</sup>                      | Corrosion-resistant steel  | Zinc-nickel plated steel  |   |     |   |   |   |   |   |      |       |
| X <sup>3)</sup>                       | Corrosion-resistant steel  | Corrosion-resistant steel |   |     |   |   |   |   |   |      |       |
| <b>Basic designation</b>              |                            |                           |   |     |   |   |   |   |   |      |       |
| <b>Bore code</b>                      |                            |                           |   |     |   |   |   |   |   |      |       |
| <b>Thread direction</b>               |                            |                           |   |     |   |   |   |   |   |      |       |
| No code                               | Right-hand thread          |                           |   |     |   |   |   |   |   |      |       |
| L <sup>5)</sup>                       | Left-hand thread           |                           |   |     |   |   |   |   |   |      |       |
| <b>Keyway</b>                         |                            |                           |   |     |   |   |   |   |   |      |       |
| No code                               | Without keyway             |                           |   |     |   |   |   |   |   |      |       |
| K <sup>4)</sup>                       | With keyway                |                           |   |     |   |   |   |   |   |      |       |
| <b>Lubricant</b>                      |                            |                           |   |     |   |   |   |   |   |      |       |
| SK1                                   | Grease G354                |                           |   |     |   |   |   |   |   |      |       |
| S181                                  | Grease G395                |                           |   |     |   |   |   |   |   |      |       |
| <b>Shield and seal</b>                |                            |                           |   |     |   |   |   |   |   |      |       |
| No code                               | Sealed                     |                           |   |     |   |   |   |   |   |      |       |
| CP199 <sup>3)</sup>                   | Shielded                   |                           |   |     |   |   |   |   |   |      |       |

<sup>3)</sup> SKF option

<sup>4)</sup> Only available for bore code 4..5

<sup>5)</sup> Not available for bore code B3N-2

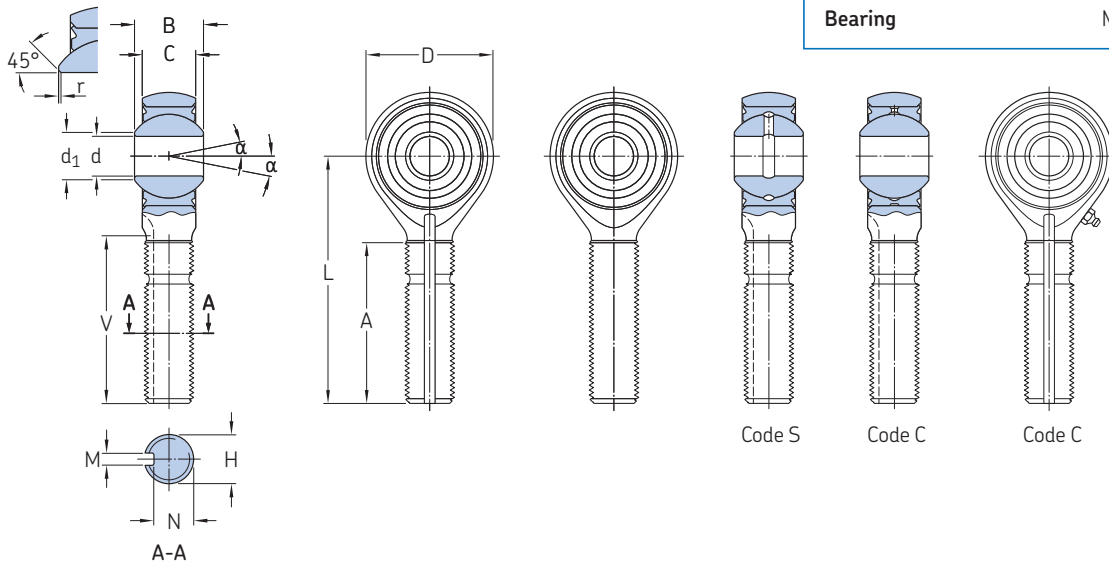
## Dimensions cont. loads, torque and clearance

| Nominal bore code            | Dimensions                      |                                |                               | $\alpha$ | Mass $\approx$ | Limit static loads |                | Maximum Starting Torque | Max internal Clearances |       |
|------------------------------|---------------------------------|--------------------------------|-------------------------------|----------|----------------|--------------------|----------------|-------------------------|-------------------------|-------|
|                              | T<br>$\pm 0,010$<br>$\pm 0,254$ | M<br>$+0,005/0$<br>$+ 0,127/0$ | N<br>$0/-0,005$<br>$0/-0,127$ |          |                | Radial<br>$C_s$    | Axial<br>$C_a$ |                         | Radial                  | Axial |
| –                            | in/mm                           |                                |                               | °        | lb/g           | lbf/kN             |                | oz.in/mN.m              | in/mm                   |       |
| <b>B 3N<sup>2)</sup></b>     | 0.438                           | –                              | –                             | 10       | 0.05           | 1 000              | 200            | 3                       | 0.0004                  | 0.003 |
| <b>3F...4-3<sup>3)</sup></b> | 11,125                          | –                              | –                             |          | 23             | 4,45               | 0,89           | 21,18                   | 0,010                   | 0,076 |
| <b>B 3N-2</b>                | 0.438                           | –                              | –                             | 10       | 0.06           | 1 000              | 200            | 3                       | 0.0004                  | 0.003 |
|                              | 11,125                          | –                              | –                             |          | 27             | 4,45               | 0,89           | 21,18                   | 0,010                   | 0,076 |
| <b>3F..4</b>                 | 0.438                           | –                              | –                             | 10       | 0.06           | 1 000              | 200            | 3                       | 0.0004                  | 0.003 |
|                              | 11,125                          | –                              | –                             |          | 27             | 4,45               | 0,89           | 21,18                   | 0,010                   | 0,076 |
| <b>4F..5</b>                 | 0.438                           | 0.062                          | 0.056                         | 10       | 0.07           | 1 720              | 345            | 4                       | 0.0004                  | 0.003 |
|                              | 11,125                          | 1,57                           | 1,42                          |          | 32             | 7,65               | 1,53           | 28,24                   | 0,010                   | 0,076 |
| <b>4F..7</b>                 | 0.625                           | –                              | –                             | 10       | 0.08           | 1 720              | 345            | 4                       | 0.0004                  | 0.003 |
|                              | 15,875                          | –                              | –                             |          | 36             | 7,65               | 1,53           | 28,24                   | 0,010                   | 0,076 |
| <b>5F..5</b>                 | 0.438                           | –                              | –                             | 10       | 0.10           | 2 920              | 585            | 6                       | 0.0004                  | 0.003 |
|                              | 11,125                          | –                              | –                             |          | 45             | 12,99              | 2,60           | 42,36                   | 0,010                   | 0,076 |

### 3.18 External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions)

EMJ/..ML..R

|                         |       |
|-------------------------|-------|
| Technical specification | –     |
| Product standard        | –     |
| Bearing                 | ML..R |



#### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d           | D                | B                    | C                | A                            | V                    | d <sub>1</sub>  | r                | H                    |
|-------------------|------------------------------------|------------------------|------------------|----------------------|------------------|------------------------------|----------------------|-----------------|------------------|----------------------|
|                   |                                    | 0/-0.0005<br>0/-0.0127 | ±0.010<br>±0.254 | 0/-0.002<br>0/-0.051 | ±0.005<br>±0.127 | +0.06/-0.03<br>+1.524/-0.762 | 0/-0.020<br>0/-0.508 | =               | ±0.005<br>±0.127 | UNJF-3A              |
| in/mm             |                                    |                        |                  |                      |                  |                              |                      |                 |                  |                      |
| <b>4,83</b>       | <b>03</b>                          | 0.1900<br>4,826        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 1.000<br>25,400              | 1.000<br>25,400      | 0.300<br>7,620  | 0.010<br>0,254   | 5/16-24<br>7,94-24   |
| <b>6,35</b>       | <b>04</b>                          | 0.2500<br>6,350        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 1.000<br>25,400              | 1.000<br>25,400      | 0.300<br>7,620  | 0.010<br>0,254   | 5/16-24<br>7,94-24   |
| <b>7,94</b>       | <b>05</b>                          | 0.3125<br>7,938        | 0.900<br>22,860  | 0.437<br>11,100      | 0.327<br>8,306   | 1.062<br>26,975              | 1.062<br>26,975      | 0.360<br>9,140  | 0.010<br>0,254   | 5/16-24<br>7,94-24   |
| <b>9,52</b>       | <b>06</b>                          | 0.3750<br>9,525        | 1.025<br>26,035  | 0.500<br>12,700      | 0.416<br>10,566  | 1.250<br>31,750              | 1.250<br>31,750      | 0.466<br>11,840 | 0.010<br>0,254   | 3/8-24<br>9,52-24    |
| <b>11,11</b>      | <b>07</b>                          | 0.4375<br>11,113       | 1.150<br>29,210  | 0.562<br>14,275      | 0.452<br>11,481  | 1.375<br>34,925              | 1.375<br>34,925      | 0.537<br>13,64  | 0.010<br>0,254   | 7/16-20<br>11,11-20  |
| <b>12,7</b>       | <b>08</b>                          | 0.5000<br>12,700       | 1.337<br>33,960  | 0.625<br>15,875      | 0.515<br>13,081  | 1.500<br>38,100              | 1.500<br>38,100      | 0.607<br>15,420 | 0.010<br>0,254   | 1/2-20<br>12,7-20    |
| <b>15,87</b>      | <b>10</b>                          | 0.6250<br>15,875       | 1.525<br>38,735  | 0.750<br>19,050      | 0.577<br>14,656  | 1.625<br>41,275              | 1.625<br>41,275      | 0.747<br>18,970 | 0.010<br>0,254   | 5/8-18<br>15,87-18   |
| <b>19,05</b>      | <b>12</b>                          | 0.7500<br>19,050       | 1.775<br>45,085  | 0.875<br>22,225      | 0.640<br>16,256  | 1.750<br>44,450              | 1.750<br>44,450      | 0.845<br>21,460 | 0.010<br>0,254   | 3/4-16<br>19,05-16   |
| <b>22,22</b>      | <b>14</b>                          | 0.8750<br>22,225       | 2.025<br>51,435  | 0.875<br>22,225      | 0.765<br>19,431  | 1.875<br>47,625              | 1.875<br>47,625      | 0.995<br>25,270 | 0.010<br>0,254   | 7/8-14<br>22,22-14   |
| <b>25,4</b>       | <b>16</b>                          | 1.0000<br>25,400       | 2.775<br>70,485  | 1.375<br>34,925      | 1.015<br>25,781  | 2.125<br>53,975              | 2.125<br>53,975      | 1.269<br>32,230 | 0.010<br>0,254   | 1 1/4-12<br>31,75-12 |

## Designation system

|                              |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
|------------------------------|-----------------------------|---|---------------------------|----|----|---|------|---|---|---|---|---|----|
| Example:                     | XEMJ/WQMLS 6,35RGZKX-2      | X | EMJ/                      | WQ | ML | S | 6,35 | R | G | Z | K | X | -2 |
|                              | EMJ/WML22,22                |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Rod end body material</b> |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Cadmium plated steel        |   |                           |    |    |   |      |   |   |   |   |   |    |
| S                            | Zinc-nickel plated steel    |   |                           |    |    |   |      |   |   |   |   |   |    |
| X                            | Corrosion-resistant steel   |   |                           |    |    |   |      |   |   |   |   |   |    |
| T <sup>1)</sup>              | Anodized titanium           |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Basic designation</b>     |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Bearing material</b>      |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
|                              | <b>Inner ring</b>           |   | <b>Outer ring</b>         |    |    |   |      |   |   |   |   |   |    |
| W                            | Corrosion-resistant steel   |   | Corrosion-resistant steel |    |    |   |      |   |   |   |   |   |    |
| Q                            | Bronze beryllium            |   | Corrosion-resistant steel |    |    |   |      |   |   |   |   |   |    |
| WQ                           | Corrosion-resistant steel   |   | Bronze aluminium          |    |    |   |      |   |   |   |   |   |    |
| <b>Lubrication grooves</b>   |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Without lubrication groove  |   |                           |    |    |   |      |   |   |   |   |   |    |
| S                            | Lubrication by inner ring   |   |                           |    |    |   |      |   |   |   |   |   |    |
| C                            | Lubrication by rod end body |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Bore code</b>             |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Thread direction</b>      |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Right-hand thread           |   |                           |    |    |   |      |   |   |   |   |   |    |
| G                            | Left-hand thread            |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Locating groove</b>       |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Without locating groove     |   |                           |    |    |   |      |   |   |   |   |   |    |
| Z                            | With locating groove        |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Keyway</b>                |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Without keyway              |   |                           |    |    |   |      |   |   |   |   |   |    |
| K                            | With keyway                 |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Internal clearance</b>    |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Standard clearance          |   |                           |    |    |   |      |   |   |   |   |   |    |
| X                            | Reduced clearance           |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Lubricant</b>             |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Grease G354                 |   |                           |    |    |   |      |   |   |   |   |   |    |
| -2                           | Grease G395                 |   |                           |    |    |   |      |   |   |   |   |   |    |

1) SKF option, masses and load carrying capability reduced compared to steel rod end body

## Dimensions cont., loads and clearance

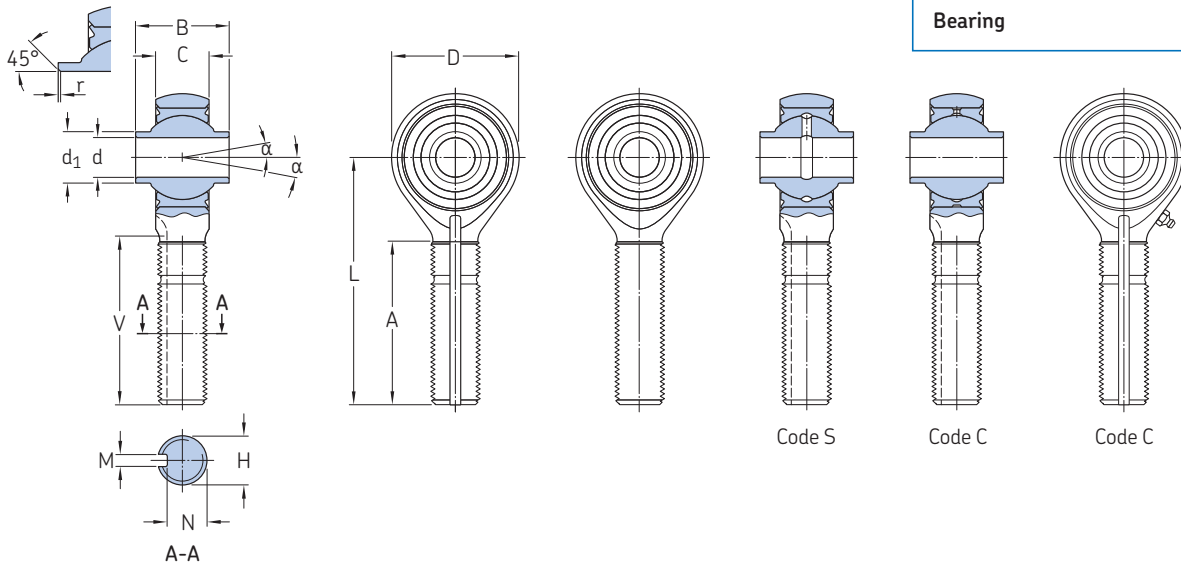
| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions            |                           | N               | α  | Mass<br>≈     | Radial loads<br>Ultimate <sup>1)</sup> | Fatigue<br>10 <sup>6</sup> cycles | Axial clearance         |                      |
|-------------------|---------------------------------------|-----------------------|---------------------------|-----------------|----|---------------|----------------------------------------|-----------------------------------|-------------------------|----------------------|
|                   |                                       | L<br>±0.010<br>±0,254 | M<br>+0.005/0<br>+0,127/0 |                 |    |               |                                        |                                   | Standard                | Reduced              |
|                   |                                       | in/mm                 |                           |                 | °  | lb/g          | lbf/kN                                 |                                   | in/μm                   |                      |
| 4,83              | 03                                    | 1.562<br>39,675       | 0.062<br>1,575            | 0.260<br>6,604  | 16 | 0.07<br>30    | 6 195<br>27,56                         | 1 052<br>4,68                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 6,35              | 04                                    | 1.562<br>39,675       | 0.062<br>1,575            | 0.260<br>6,604  | 16 | 0.07<br>30    | 6 195<br>27,56                         | 1 052<br>4,68                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 7,94              | 05                                    | 1.875<br>47,625       | 0.062<br>1,575            | 0.260<br>6,604  | 15 | 0.08<br>35    | 7 585<br>33,74                         | 1 090<br>4,85                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 9,52              | 06                                    | 1.938<br>49,225       | 0.093<br>2,362            | 0.311<br>7,90   | 9  | 0.12<br>55    | 8 940<br>39,78                         | 1 513<br>6,73                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 11,11             | 07                                    | 2.125<br>53,975       | 0.093<br>2,362            | 0.370<br>9,40   | 11 | 0.17<br>75    | 9 595<br>42,68                         | 1 920<br>8,54                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 12,7              | 08                                    | 2.438<br>61,925       | 0.093<br>2,362            | 0.436<br>11,074 | 9  | 0.28<br>127   | 18 750<br>83,40                        | 3 069<br>13,65                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 15,87             | 10                                    | 2.625<br>66,675       | 0.125<br>3,175            | 0.541<br>13,741 | 12 | 0.38<br>172   | 20 680<br>91,99                        | 3 480<br>15,48                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 19,05             | 12                                    | 2.875<br>73,025       | 0.125<br>3,175            | 0.663<br>16,840 | 13 | 0.58<br>263   | 27 795<br>123,64                       | 4 586<br>20,40                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 22,22             | 14                                    | 3.375<br>85,725       | 0.156<br>3,962            | 0.777<br>19,735 | 6  | 0.81<br>370   | 31 725<br>141,12                       | 5 348<br>23,79                    | 0.0012/0.0047<br>30/120 | 0.0024 max<br>60 max |
| 25,4              | 16                                    | 4.125<br>104,775      | 0.187<br>4,750            | 1.136<br>28,854 | 12 | 2.40<br>1 100 | 71 745<br>319,14                       | 11 990<br>53,33                   | 0.0012/0.0047<br>30/120 | 0.0024 max<br>60 max |

1) Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

### 3.19 External thread rod end with inserted metal-to-metal high misalignment spherical plain bearing (inch dimensions)

EMJ/..MT..R

|                         |            |
|-------------------------|------------|
| Technical specification | —          |
| Product standard        | —          |
| Bearing                 | MT..R inch |



#### Dimensions

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions<br>d<br>0/-0.0005<br>0/-0.0127 | D<br>+0.035/-0.010<br>+0.889/-0.254 | B<br>0/-0.005<br>0/-0.127 | C<br>±0.005<br>±0.127 | A<br>+0.06/-0.03<br>+1.524/-0.762 | V<br>0/-0.020<br>0/-0.508 | d <sub>1</sub><br>≈ | r<br>+0.012/0<br>+0.230/0 | H<br>UNJF-3A         |
|-------------------|---------------------------------------|-------------------------------------------|-------------------------------------|---------------------------|-----------------------|-----------------------------------|---------------------------|---------------------|---------------------------|----------------------|
| —                 | —                                     | in/mm                                     |                                     |                           |                       |                                   |                           |                     |                           | —                    |
| <b>4,83</b>       | <b>03</b>                             | 0.1900<br>4,826                           | 0.750<br>19,050                     | 0.500<br>12,700           | 0.220<br>5,588        | 1.000<br>25,400                   | 1.000<br>25,400           | 0.315<br>8,000      | 0.004<br>0,100            | 5/16-24<br>7,94-24   |
| <b>6,35</b>       | <b>04</b>                             | 0.2500<br>6,350                           | 1.000<br>25,400                     | 0.593<br>15,062           | 0.265<br>6,731        | 1.250<br>31,750                   | 1.250<br>31,750           | 0.386<br>9,800      | 0.004<br>0,100            | 3/8-24<br>9,52-24    |
| <b>7,94</b>       | <b>05</b>                             | 0.3125<br>7,938                           | 1.125<br>28,575                     | 0.813<br>20,650           | 0.355<br>9,017        | 1.375<br>34,925                   | 1.375<br>34,925           | 0.512<br>13,000     | 0.004<br>0,100            | 7/16-20<br>11,11-20  |
| <b>9,52</b>       | <b>06</b>                             | 0.3750<br>9,525                           | 1.125<br>28,575                     | 0.813<br>20,650           | 0.355<br>9,017        | 1.375<br>34,925                   | 1.375<br>34,925           | 0.532<br>13,500     | 0.004<br>0,100            | 7/16-20<br>11,11-20  |
| <b>11,11</b>      | <b>07</b>                             | 0.4375<br>11,113                          | 1.312<br>33,325                     | 0.875<br>22,225           | 0.355<br>9,017        | 1.500<br>38,100                   | 1.500<br>38,100           | 0.620<br>15,750     | 0.004<br>0,100            | 1/2-20<br>12,7-20    |
| <b>12,7</b>       | <b>08</b>                             | 0.5000<br>12,700                          | 1.500<br>38,100                     | 0.937<br>23,799           | 0.411<br>10,439       | 1.625<br>41,275                   | 1.625<br>41,275           | 0.728<br>18,480     | 0.004<br>0,100            | 5/8-18<br>15,87-18   |
| <b>15,87</b>      | <b>10</b>                             | 0.6250<br>15,875                          | 1.750<br>44,450                     | 1.200<br>30,480           | 0.577<br>14,656       | 1.750<br>44,450                   | 1.750<br>44,450           | 0.857<br>21,770     | 0.004<br>0,100            | 3/4-16<br>19,05-16   |
| <b>19,05</b>      | <b>12</b>                             | 0.7500<br>19,050                          | 2.000<br>50,800                     | 1.280<br>32,512           | 0.630<br>16,002       | 1.875<br>47,625                   | 1.875<br>47,625           | 0.963<br>24,450     | 0.004<br>0,100            | 7/8-14<br>22,22-14   |
| <b>22,22</b>      | <b>14</b>                             | 0.8750<br>22,225                          | 2.200<br>55,880                     | 1.400<br>35,560           | 0.635<br>16,129       | 2.000<br>50,800                   | 2.000<br>50,800           | 1.122<br>28,490     | 0.004<br>0,100            | 7/8-14<br>22,22-14   |
| <b>25,4</b>       | <b>16</b>                             | 1.0000<br>25,400                          | 2.750<br>69,850                     | 1.875<br>47,625           | 0.845<br>21,463       | 2.125<br>53,975                   | 2.125<br>53,975           | 1.272<br>32,320     | 0.004<br>0,100            | 1 1/4-12<br>31,75-12 |



## Designation system

|                              |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
|------------------------------|-----------------------------|---|---------------------------|----|----|---|------|---|---|---|---|---|----|
| Example:                     | XEMJ/WQMLS 6,35RGZKX-2      | X | EMJ/                      | WQ | ML | S | 6,35 | R | G | Z | K | X | -2 |
|                              | EMJ/WML22,22                |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Rod end body material</b> |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Cadmium plated steel        |   |                           |    |    |   |      |   |   |   |   |   |    |
| S                            | Zinc-nickel plated steel    |   |                           |    |    |   |      |   |   |   |   |   |    |
| X                            | Corrosion-resistant steel   |   |                           |    |    |   |      |   |   |   |   |   |    |
| T <sup>1)</sup>              | Anodized titanium           |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Basic designation</b>     |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Bearing material</b>      |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
|                              | <b>Inner ring</b>           |   | <b>Outer ring</b>         |    |    |   |      |   |   |   |   |   |    |
| W                            | Corrosion-resistant steel   |   | Corrosion-resistant steel |    |    |   |      |   |   |   |   |   |    |
| Q                            | Bronze beryllium            |   | Corrosion-resistant steel |    |    |   |      |   |   |   |   |   |    |
| WQ                           | Corrosion-resistant steel   |   | Bronze aluminium          |    |    |   |      |   |   |   |   |   |    |
| <b>Lubrication grooves</b>   |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Without lubrication groove  |   |                           |    |    |   |      |   |   |   |   |   |    |
| S                            | Lubrication by inner ring   |   |                           |    |    |   |      |   |   |   |   |   |    |
| C                            | Lubrication by rod end body |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Bore code</b>             |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Thread direction</b>      |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Right-hand thread           |   |                           |    |    |   |      |   |   |   |   |   |    |
| G                            | Left-hand thread            |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Locating groove</b>       |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Without locating groove     |   |                           |    |    |   |      |   |   |   |   |   |    |
| Z                            | With locating groove        |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Keyway</b>                |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Without keyway              |   |                           |    |    |   |      |   |   |   |   |   |    |
| K                            | With keyway                 |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Internal clearance</b>    |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Standard clearance          |   |                           |    |    |   |      |   |   |   |   |   |    |
| X                            | Reduced clearance           |   |                           |    |    |   |      |   |   |   |   |   |    |
| <b>Lubricant</b>             |                             |   |                           |    |    |   |      |   |   |   |   |   |    |
| No code                      | Grease G354                 |   |                           |    |    |   |      |   |   |   |   |   |    |
| -2                           | Grease G395                 |   |                           |    |    |   |      |   |   |   |   |   |    |

1) SKF option, masses and load carrying capability reduced compared to steel rod end body

## Dimensions cont., loads and clearance

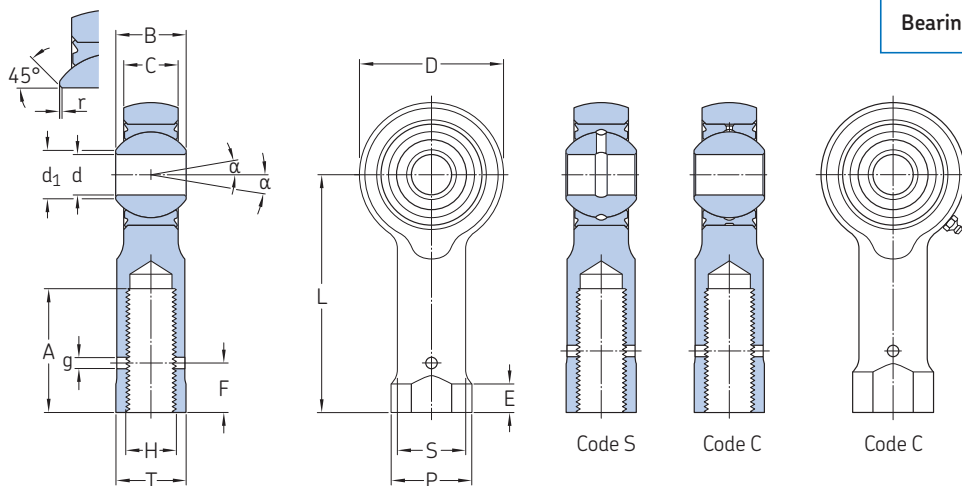
| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions            |                           | N<br>0/−0.005<br>0/−0.127 | α  | Mass<br>≈   | Radial loads<br>Ultimate <sup>1)</sup> | Fatigue<br>10 <sup>6</sup> cycles | Axial clearance         |                      |
|-------------------|---------------------------------------|-----------------------|---------------------------|---------------------------|----|-------------|----------------------------------------|-----------------------------------|-------------------------|----------------------|
|                   |                                       | L<br>±0.010<br>±0,254 | M<br>+0.005/0<br>+0,127/0 |                           |    |             |                                        |                                   | Standard                | Reduced              |
|                   |                                       | in/mm                 |                           |                           | °  | lb/g        | lbf/kN                                 |                                   | in/μm                   |                      |
| 4,83              | 03                                    | 1.500<br>38,100       | 0.062<br>1,575            | 0.260<br>6,604            | 15 | 0.06<br>27  | 4 800<br>21,35                         | 762<br>3,39                       | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 6,35              | 04                                    | 1.938<br>49,225       | 0.093<br>2,362            | 0.311<br>7,899            | 24 | 0.11<br>50  | 8 185<br>36,41                         | 1 311<br>5,83                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 7,94              | 05                                    | 2.125<br>53,975       | 0.093<br>2,362            | 0.370<br>9,400            | 23 | 0.16<br>73  | 8 620<br>38,34                         | 1 414<br>6,29                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 9,52              | 06                                    | 2.125<br>53,975       | 0.093<br>2,362            | 0.370<br>9,40             | 22 | 0.16<br>73  | 8 620<br>38,34                         | 1 414<br>6,29                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 11,11             | 07                                    | 2.438<br>61,925       | 0.093<br>2,362            | 0.436<br>11,07            | 22 | 0.25<br>114 | 13 025<br>57,94                        | 2 104<br>9,36                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 12,7              | 08                                    | 2,625<br>66,675       | 0,125<br>3,175            | 0,541<br>13,741           | 20 | 0,41<br>186 | 18 165<br>80,80                        | 2 947<br>13,11                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 15,87             | 10                                    | 2,875<br>73,025       | 0,125<br>3,175            | 0,663<br>16,840           | 20 | 0,64<br>290 | 24 010<br>106,80                       | 3 973<br>17,67                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 19,05             | 12                                    | 3,375<br>85,725       | 0,156<br>3,962            | 0,777<br>19,735           | 19 | 0,92<br>417 | 26 990<br>120,06                       | 5 052<br>22,47                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 22,22             | 14                                    | 3,750<br>95,250       | 0,156<br>3,962            | 0,777<br>19,735           | 19 | 1,11<br>508 | 28 880<br>128,46                       | 5 295<br>23,55                    | 0.0012/0.0047<br>30/120 | 0.0024 max<br>60 max |
| 25,4              | 16                                    | 4,125<br>104,775      | 0,187<br>4,750            | 1,136<br>28,854           | 21 | 2,14<br>970 | 60 230<br>267,92                       | 9 858<br>43,85                    | 0.0012/0.0047<br>30/120 | 0.0024 max<br>60 max |

1) Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

### 3.20 Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions)

EFJ/..ML..R

|                         |       |
|-------------------------|-------|
| Technical specification | –     |
| Product standard        | –     |
| Bearing                 | ML..R |



#### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d           | D                | B                    | C                | A                            | d <sub>1</sub>  | r                | g             | H                   | L                |
|-------------------|------------------------------------|------------------------|------------------|----------------------|------------------|------------------------------|-----------------|------------------|---------------|---------------------|------------------|
|                   |                                    | 0/-0.0005<br>0/-0.0127 | ±0.010<br>±0.254 | 0/-0.002<br>0/-0.051 | ±0.005<br>±0.127 | +0.06/-0.03<br>+1.524/-0.762 | ≈               | ±0.005<br>±0.127 | ≈             | UNJF-3B             | ±0.010<br>±0.254 |
| –                 |                                    | in/mm                  |                  |                      |                  |                              |                 |                  |               |                     | –                |
| 4,83              | 03                                 | 0.1900<br>4,826        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 0.750<br>19,050              | 0.300<br>7,620  | 0.010<br>0,254   | 0.07<br>1,778 | 5/16-24<br>7,94-24  | 1.375<br>34,925  |
| 6,35              | 04                                 | 0.2500<br>6,350        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 0.750<br>19,050              | 0.300<br>7,620  | 0.010<br>0,254   | 0.07<br>1,778 | 5/16-24<br>7,94-24  | 1.469<br>37,312  |
| 7,94              | 05                                 | 0.3125<br>7,938        | 0.900<br>22,860  | 0.437<br>11,100      | 0.327<br>8,306   | 0.750<br>19,050              | 0.360<br>9,140  | 0.010<br>0,254   | 0.07<br>1,778 | 5/16-24<br>7,94-24  | 1.375<br>34,925  |
| 9,52              | 06                                 | 0.3750<br>9,525        | 1.025<br>26,035  | 0.500<br>12,700      | 0.416<br>10,566  | 0.937<br>23,780              | 0.466<br>11,840 | 0.010<br>0,254   | 0.07<br>1,778 | 3/8-24<br>9,52-24   | 1.625<br>41,275  |
| 11,11             | 07                                 | 0.4375<br>11,113       | 1.150<br>29,210  | 0.562<br>14,275      | 0.452<br>11,481  | 1.062<br>26,975              | 0.537<br>13,64  | 0.010<br>0,254   | 0.07<br>1,778 | 7/16-20<br>11,11-20 | 1.812<br>46,025  |
| 12,7              | 08                                 | 0.5000<br>12,700       | 1.337<br>33,960  | 0.625<br>15,875      | 0.515<br>13,081  | 1.125<br>28,575              | 0.607<br>15,420 | 0.010<br>0,254   | 0.07<br>1,778 | 1/2-20<br>12,7-20   | 2.125<br>53,975  |
| 15,87             | 10                                 | 0.6250<br>15,875       | 1.525<br>38,735  | 0.750<br>19,050      | 0.577<br>14,656  | 1.500<br>38,100              | 0.747<br>18,970 | 0.010<br>0,254   | 0.07<br>1,778 | 5/8-18<br>15,87-18  | 2.625<br>66,675  |
| 19,05             | 12                                 | 0.7500<br>19,050       | 1.775<br>45,085  | 0.875<br>22,225      | 0.640<br>16,256  | 1.620<br>41,148              | 0.845<br>21,460 | 0.010<br>0,254   | 0.07<br>1,778 | 3/4-16<br>19,05-16  | 2.875<br>73,025  |
| 22,22             | 14                                 | 0.8750<br>22,225       | 2.025<br>51,435  | 0.875<br>22,225      | 0.765<br>19,431  | 1.875<br>47,625              | 0.995<br>25,270 | 0.010<br>0,254   | 0.07<br>1,778 | 7/8-14<br>22,22-14  | 3.375<br>85,725  |
| 25,4              | 16                                 | 1.0000<br>25,400       | 2.775<br>70,485  | 1.375<br>34,925      | 1.015<br>25,781  | 2.125<br>53,975              | 1.269<br>32,230 | 0.010<br>0,254   | 0.07<br>1,778 | 1-12<br>25,4-12     | 4.125<br>104,775 |

## Designation system

Examples: XEFJ/WQMLS 6,35RGX-2  
XEFJ/WML22,22

X EFJ/ WQ ML S 6,35 R G X -2

### Rod end body material

No code Cadmium plated steel  
S Zinc-nickel plated steel  
X Corrosion-resistant steel  
T<sup>1)</sup> Anodized titanium

### Basic designation

#### Bearing material

|    |                           |                           |
|----|---------------------------|---------------------------|
|    | <b>Inner ring</b>         | <b>Outer ring</b>         |
| W  | Corrosion-resistant steel | Corrosion-resistant steel |
| Q  | Bronze beryllium          | Corrosion-resistant steel |
| WQ | Corrosion-resistant steel | Bronze aluminium          |

#### Lubrication grooves

No code Without lubrication groove  
S Lubrication by inner ring  
C Lubrication by rod end body

#### Bore code

#### Thread direction

No code Right-hand thread  
G Left-hand thread

#### Internal clearance

No code Standard clearance  
X Reduced clearance

#### Lubricant

No code Grease G354  
-2 Grease G395

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body

## Dimensions cont., loads and clearance

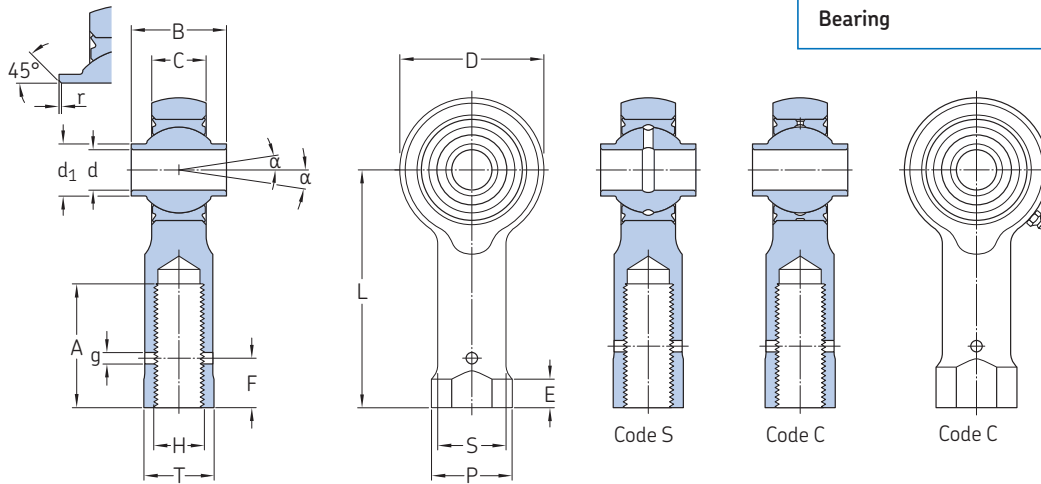
| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions      |                 | E            | S                | T                             | α  | Mass        | Radial loads           |                                   | Axial clearance         |                      |
|-------------------|---------------------------------------|-----------------|-----------------|--------------|------------------|-------------------------------|----|-------------|------------------------|-----------------------------------|-------------------------|----------------------|
|                   |                                       | P               | F               | ≈            | ±0.005<br>±0,127 | +0.03/-0.010<br>+0,076/-0,254 |    | ≈           | Ultimate <sup>1)</sup> | Fatigue<br>10 <sup>6</sup> cycles | Standard                | Reduced              |
|                   |                                       | in/mm           |                 |              |                  |                               | °  | lb/g        | lbf/kN                 |                                   | in/μm                   |                      |
| 4,83              | 03                                    | 0.500<br>12,700 | 0.380<br>9,652  | 0.25<br>6,35 | 0.422<br>10,719  | 0.437<br>11,100               | 16 | 0.07<br>32  | 6 195<br>27,56         | 1 052<br>4,68                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 6,35              | 04                                    | 0.500<br>12,700 | 0.380<br>9,652  | 0.25<br>6,35 | 0.422<br>10,719  | 0.437<br>11,100               | 16 | 0.07<br>32  | 6 195<br>27,56         | 1 052<br>4,68                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 7,94              | 05                                    | 0.500<br>12,700 | 0.380<br>9,652  | 0.25<br>6,35 | 0.422<br>10,719  | 0.437<br>11,100               | 15 | 0.10<br>45  | 7 585<br>33,74         | 1 090<br>4,85                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 9,52              | 06                                    | 0.625<br>15,875 | 0.440<br>11,176 | 0.25<br>6,35 | 0.567<br>14,402  | 0.582<br>14,782               | 9  | 0.12<br>55  | 8 940<br>39,77         | 1 513<br>6,73                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 11,11             | 07                                    | 0.687<br>17,450 | 0.500<br>12,700 | 0.25<br>6,35 | 0.610<br>15,494  | 0.625<br>15,875               | 11 | 0.20<br>92  | 9 595<br>42,68         | 1 920<br>8,54                     | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 12,7              | 08                                    | 0.812<br>20,625 | 0.560<br>14,224 | 0.25<br>6,35 | 0.735<br>18,669  | 0.750<br>19,050               | 9  | 0.28<br>140 | 18 750<br>83,40        | 3 069<br>13,65                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 15,87             | 10                                    | 1.000<br>25,400 | 0.690<br>17,526 | 0.25<br>6,35 | 0.860<br>21,844  | 0.875<br>22,225               | 12 | 0.45<br>205 | 20 680<br>91,99        | 3 480<br>15,48                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 19,05             | 12                                    | 1.060<br>26,924 | 0.820<br>20,828 | 0.25<br>6,35 | 0.985<br>25,019  | 1.000<br>25,400               | 13 | 0.55<br>250 | 27 795<br>123,64       | 4 586<br>20,40                    | 0.0010/0.0040<br>25/100 | 0.0020 max<br>50 max |
| 22,22             | 14                                    | 1.187<br>30,150 | 0.940<br>23,876 | 0.25<br>6,35 | 1.110<br>28,194  | 1.125<br>28,575               | 6  | 1.00<br>450 | 31 725<br>141,12       | 5 348<br>23,79                    | 0.0012/0.0047<br>30/120 | 0.0024 max<br>60 max |
| 25,4              | 16                                    | 1.312<br>33,325 | 1.070<br>27,178 | 0.25<br>6,35 | 1,235<br>31,369  | 1,250<br>31,750               | 12 | 1,45<br>660 | 71 745<br>319,14       | 8 377<br>37,26                    | 0.0012/0.0047<br>30/120 | 0.0024 max<br>60 max |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

### 3.21 Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions)

EFJ/..MT..R

|                         |            |
|-------------------------|------------|
| Technical specification | –          |
| Product standard        | –          |
| Bearing                 | MT..R inch |



#### Dimensions

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions       |                 | B                    | C                | A                            | d <sub>1</sub>  | r                    | g             | H                    | L                |
|-------------------|---------------------------------------|------------------|-----------------|----------------------|------------------|------------------------------|-----------------|----------------------|---------------|----------------------|------------------|
|                   |                                       | d                | D               | 0/–0.005<br>0/–0,127 | ±0.005<br>±0,127 | +0.06/–0.03<br>+1,524/–0,762 | ≈               | +0.012/0<br>+0,230/0 | ≈             | UNJF-3B              | ±0.010<br>±0,254 |
| –                 |                                       | in/mm            |                 |                      |                  |                              |                 |                      |               | –                    | in/mm            |
| <b>4,83</b>       | <b>03</b>                             | 0.1900<br>4,826  | 0.750<br>19,050 | 0.500<br>12,700      | 0.220<br>5,588   | 0.750<br>19,050              | 0.315<br>8,000  | 0.004<br>0,100       | 0.07<br>1,778 | 5/16-24<br>7,94-24   | 1.375<br>34,925  |
| <b>6,35</b>       | <b>04</b>                             | 0.2500<br>6,350  | 1.000<br>25,400 | 0.593<br>15,062      | 0.265<br>6,731   | 0.937<br>23,780              | 0.386<br>9,800  | 0.004<br>0,100       | 0.07<br>1,778 | 3/8-24<br>9,52-24    | 1.625<br>41,275  |
| <b>7,94</b>       | <b>05</b>                             | 0.3125<br>7,938  | 1.125<br>28,575 | 0.813<br>20,650      | 0.355<br>9,017   | 1.062<br>26,975              | 0.512<br>13,000 | 0.004<br>0,100       | 0.07<br>1,778 | 7/16-20<br>11,11-20  | 1.812<br>46,025  |
| <b>9,52</b>       | <b>06</b>                             | 0.3750<br>9,525  | 1.125<br>28,575 | 0.813<br>20,650      | 0.355<br>9,017   | 1.062<br>26,975              | 0.532<br>13,500 | 0.004<br>0,100       | 0.07<br>1,778 | 7/16-20<br>11,11-20  | 1.812<br>46,025  |
| <b>11,11</b>      | <b>07</b>                             | 0.4375<br>11,113 | 1.312<br>33,325 | 0.875<br>22,225      | 0.355<br>9,017   | 1.125<br>28,575              | 0.620<br>15,750 | 0.004<br>0,100       | 0.07<br>1,778 | 1/2-20<br>12,7-20    | 2.125<br>53,975  |
| <b>12,7</b>       | <b>08</b>                             | 0.5000<br>12,700 | 1.500<br>38,100 | 0.937<br>23,799      | 0.411<br>10,439  | 1.500<br>38,100              | 0.728<br>18,480 | 0.004<br>0,100       | 0.07<br>1,778 | 5/8-18<br>15,87-18   | 2.625<br>66,675  |
| <b>15,87</b>      | <b>10</b>                             | 0.6250<br>15,875 | 1.750<br>44,450 | 1.200<br>30,480      | 0.577<br>14,656  | 1.750<br>44,450              | 0.857<br>21,770 | 0.004<br>0,100       | 0.07<br>1,778 | 3/4-16<br>19,05-16   | 2.875<br>73,025  |
| <b>19,05</b>      | <b>12</b>                             | 0.7500<br>19,050 | 2.000<br>50,800 | 1.280<br>32,512      | 0.630<br>16,002  | 1.875<br>47,625              | 0.963<br>24,450 | 0.004<br>0,100       | 0.07<br>1,778 | 7/8-14<br>22,22-14   | 2.875<br>73,025  |
| <b>22,22</b>      | <b>14</b>                             | 0.8750<br>22,225 | 2.200<br>55,880 | 1.400<br>35,560      | 0.635<br>16,129  | 2.000<br>50,800              | 1.122<br>28,490 | 0.004<br>0,100       | 0.07<br>1,778 | 7/8-14<br>22,22-14   | 3.375<br>85,725  |
| <b>25,4</b>       | <b>16</b>                             | 1.0000<br>25,400 | 2.750<br>69,850 | 1.875<br>47,625      | 0.845<br>21,463  | 2.125<br>53,975              | 1.272<br>32,320 | 0.004<br>0,100       | 0.07<br>1,778 | 1 1/4-12<br>31,75-12 | 4.125<br>104,775 |

**Designation system**Examples: XEFJ/WQMTS 6,35RGX-2  
XEFJ/WMT22,22

X EFJ/ WQ MT S 6,35 R G X -2

**Rod end body material****No code** Cadmium plated steel  
**S** Zinc-nickel plated steel  
**X** Corrosion-resistant steel  
**T<sup>1)</sup>** Anodized titanium**Basic designation****Bearing material**

|           | <b>Inner ring</b>         | <b>Outer ring</b>         |
|-----------|---------------------------|---------------------------|
| <b>W</b>  | Corrosion-resistant steel | Corrosion-resistant steel |
| <b>Q</b>  | Bronze beryllium          | Corrosion-resistant steel |
| <b>WQ</b> | Corrosion-resistant steel | Bronze aluminium          |

**Lubrication grooves****No code** Without lubrication groove  
**S** Lubrication by inner ring  
**C** Lubrication by rod end body**Bore code****Thread direction****No code** Right-hand thread  
**G** Left-hand thread**Internal clearance****No code** Standard clearance  
**X** Reduced clearance**Lubricant****No code** Grease G354  
**-2** Grease G395

1) SKF option, masses and load carrying capability reduced compared to steel rod end body

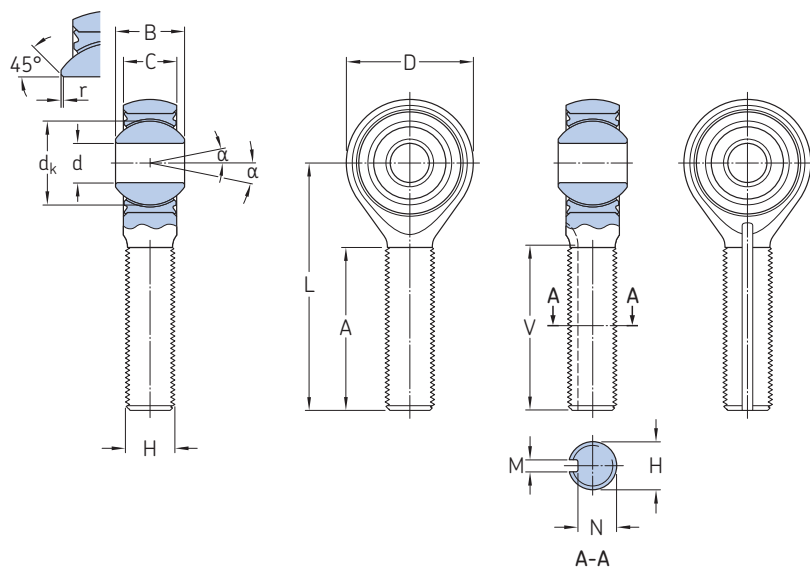
**Dimensions cont., loads and clearance**

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions            |                       | E<br>≈       | S<br>±0.005<br>±0,127 | T<br>±0.010<br>±0,254 | α  | Mass<br>≈   | Radial loads           |                | Fatigue<br>10 <sup>6</sup> cycles | Axial clearance      |  |
|-------------------|---------------------------------------|-----------------------|-----------------------|--------------|-----------------------|-----------------------|----|-------------|------------------------|----------------|-----------------------------------|----------------------|--|
|                   |                                       | P<br>±0.010<br>±0,254 | F<br>±0.015<br>±0,381 |              |                       |                       |    |             | Ultimate <sup>1)</sup> | Standard       |                                   | Reduced              |  |
| –                 |                                       | in/mm                 |                       |              |                       |                       | °  | lb/g        | lbf/kN                 |                |                                   | in/μm                |  |
| 4,83              | 03                                    | 0.500<br>12,700       | 0.380<br>9,652        | 0.25<br>6,35 | 0.422<br>10,719       | 0.437<br>11,100       | 15 | 0.07<br>31  | 4 800<br>21,35         | 762<br>3,39    | 0.0010/0.0040<br>25/100           | 0.0020 max<br>50 max |  |
| 6,35              | 04                                    | 0.625<br>15,875       | 0.440<br>11,176       | 0.25<br>6,35 | 0.567<br>14,402       | 0.582<br>14,782       | 24 | 0.13<br>60  | 8 185<br>36,41         | 1 311<br>5,83  | 0.0010/0.0040<br>25/100           | 0.0020 max<br>50 max |  |
| 7,94              | 05                                    | 0.687<br>17,450       | 0.500<br>12,700       | 0.25<br>6,35 | 0.610<br>15,494       | 0.625<br>15,875       | 23 | 0.19<br>85  | 8 620<br>38,34         | 1 414<br>6,29  | 0.0010/0.0040<br>25/100           | 0.0020 max<br>50 max |  |
| 9,52              | 06                                    | 0.687<br>17,450       | 0.500<br>12,700       | 0.25<br>6,35 | 0.610<br>15,494       | 0.625<br>15,875       | 22 | 0.19<br>85  | 8 620<br>38,34         | 1 414<br>6,29  | 0.0010/0.0040<br>25/100           | 0.0020 max<br>50 max |  |
| 11,11             | 07                                    | 0.812<br>20,625       | 0.560<br>14,224       | 0.25<br>6,35 | 0.735<br>18,669       | 0.750<br>19,050       | 22 | 0.31<br>140 | 13 025<br>57,94        | 2 104<br>9,36  | 0.0010/0.0040<br>25/100           | 0.0020 max<br>50 max |  |
| 12,7              | 08                                    | 1.000<br>25,400       | 0.690<br>17,526       | 0.25<br>6,35 | 0.860<br>21,844       | 0.875<br>22,225       | 20 | 0.49<br>220 | 18 165<br>80,80        | 2 947<br>13,11 | 0.0010/0.0040<br>25/100           | 0.0020 max<br>50 max |  |
| 15,87             | 10                                    | 1.060<br>26,924       | 0.820<br>20,828       | 0.25<br>6,35 | 0.985<br>25,019       | 1.000<br>25,400       | 20 | 0.71<br>321 | 24 010<br>106,80       | 3 973<br>17,67 | 0.0010/0.0040<br>25/100           | 0.0020 max<br>50 max |  |
| 19,05             | 12                                    | 1.187<br>30,150       | 0.940<br>23,876       | 0.25<br>6,35 | 1.110<br>28,194       | 1.125<br>28,575       | 19 | 0.97<br>440 | 26 990<br>120,06       | 5 052<br>22,47 | 0.0010/0.0040<br>25/100           | 0.0020 max<br>50 max |  |
| 22,22             | 14                                    | 1.187<br>30,150       | 0.940<br>23,876       | 0.25<br>6,35 | 1.110<br>28,194       | 1.125<br>28,575       | 19 | 1.11<br>501 | 28 880<br>128,46       | 5 295<br>23,55 | 0.0012/0.0047<br>30/120           | 0.0024 max<br>60 max |  |
| 25,4              | 16                                    | 2.020<br>51,308       | 1.070<br>27,178       | 0.25<br>6,35 | 1.688<br>42,875       | 1.250<br>31,750       | 21 | 2.00<br>908 | 60 230<br>267,92       | 9 858<br>43,85 | 0.0012/0.0047<br>30/120           | 0.0024 max<br>60 max |  |

1) Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

### 3.22 External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

MJ/WAS.. (UMJ/XRL.. or 12BM..)¹



|                         |                                                                   |
|-------------------------|-------------------------------------------------------------------|
| Technical specification | AS 81935                                                          |
| Product standard        | AS 81935/1                                                        |
| Bearing                 | WAS..R inch (440C inner ring)<br>EWAS..R inch (PH13.8 inner ring) |

#### Dimensions

| Nominal bore code | Dimensions d           | D                | B                    | C                | A               | d <sub>k</sub>  | r                | H                    | L                |
|-------------------|------------------------|------------------|----------------------|------------------|-----------------|-----------------|------------------|----------------------|------------------|
|                   | 0/-0.0005<br>0/-0.0127 | ±0.010<br>±0.254 | 0/-0.002<br>0/-0.051 | ±0.005<br>±0.127 | ±0.031<br>±0.79 | ≈               | ±0.005<br>±0.127 | UNJF-3A              | ±0.010<br>±0.254 |
| –                 | in/mm                  |                  |                      |                  |                 |                 |                  | –                    | in/mm            |
| <b>03</b>         | 0.1900<br>4,826        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 0.968<br>24,587 | 0.530<br>13,464 | 0.010<br>0,254   | 5/16-24<br>7,94-24   | 1.562<br>39,675  |
| <b>04</b>         | 0.2500<br>6,350        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 0.968<br>24,587 | 0.530<br>13,464 | 0.010<br>0,254   | 5/16-24<br>7,94-24   | 1.562<br>39,675  |
| <b>05</b>         | 0.3125<br>7,938        | 0.900<br>22,860  | 0.437<br>11,100      | 0.327<br>8,306   | 1.187<br>30,150 | 0.566<br>14,381 | 0.010<br>0,254   | 5/16-24<br>7,94-24   | 1.875<br>47,625  |
| <b>06</b>         | 0.3750<br>9,525        | 1.025<br>26,035  | 0.500<br>12,700      | 0.416<br>10,566  | 1.187<br>30,150 | 0.683<br>17,361 | 0.010<br>0,254   | 3/8-24<br>9,52-24    | 1.938<br>49,225  |
| <b>07</b>         | 0.4375<br>11,113       | 1.150<br>29,210  | 0.562<br>14,275      | 0.452<br>11,481  | 1.281<br>32,537 | 0.777<br>19,744 | 0.010<br>0,254   | 7/16-20<br>11,11-20  | 2.125<br>53,975  |
| <b>08</b>         | 0.5000<br>12,700       | 1.337<br>33,960  | 0.625<br>15,875      | 0.515<br>13,081  | 1.468<br>37,287 | 0.871<br>22,130 | 0.010<br>0,254   | 1/2-20<br>12,7-20    | 2.438<br>61,925  |
| <b>10</b>         | 0.6250<br>15,875       | 1.525<br>38,735  | 0.750<br>19,050      | 0.577<br>14,656  | 1.562<br>39,675 | 1.059<br>26,887 | 0.010<br>0,254   | 5/8-18<br>15,87-18   | 2.625<br>66,675  |
| <b>12</b>         | 0.7500<br>19,050       | 1.775<br>45,085  | 0.875<br>22,225      | 0.640<br>16,256  | 1.687<br>42,850 | 1.216<br>30,897 | 0.010<br>0,254   | 3/4-16<br>19,05-16   | 2.875<br>73,025  |
| <b>14</b>         | 0.8750<br>22,225       | 2.025<br>51,435  | 0.875<br>22,225      | 0.765<br>19,431  | 2.000<br>50,800 | 1.325<br>33,655 | 0.010<br>0,254   | 7/8-14<br>22,22-14   | 3.375<br>85,725  |
| <b>16</b>         | 1.0000<br>25,400       | 2.775<br>70,485  | 1.375<br>34,925      | 1.015<br>25,781  | 2.343<br>59,512 | 1.871<br>47,526 | 0.010<br>0,254   | 1 1/4-12<br>31,75-12 | 4.125<br>104,775 |

¹) Parts are delivered and marked with UMJ/XRL.. and 12BM.. standard references



### Cross-reference designation system to UMJ/XRL.. or 12BM..

Examples: SEMJ/WAS04GK  
MJ/WAS14

#### Rod end body material and surface treatment

No code Cadmium plated 4340 steel  
S<sup>2)</sup> Zinc-nickel plated 4340 steel

#### Inner ring material

No code 440C (WAS..R bearing)  
E PH13.8 (EWAS..R bearing)

#### Basic designation

Bore code (multiples of 1/16 inch)

#### Thread direction

No code Right-hand thread  
G Left-hand thread

#### Keyway

No code Without keyway  
K With keyway

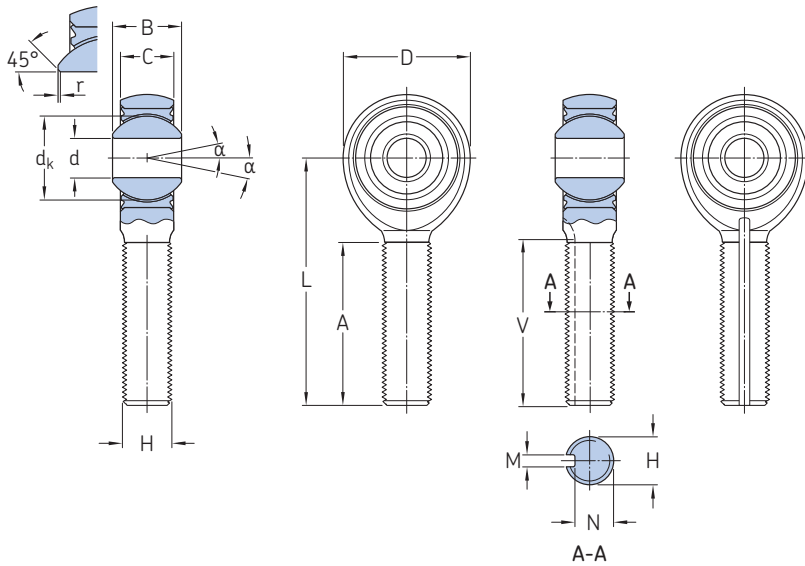
<sup>2)</sup> SKF option

### Dimensions cont., loads and torque

| Nominal bore code | Dimensions           |                      |                      |          | Mass           | Radial loads     | Fatigue          | Starting torque      |
|-------------------|----------------------|----------------------|----------------------|----------|----------------|------------------|------------------|----------------------|
|                   | M                    | N                    | V                    | $\alpha$ | $\approx$      | Ultimate         | 50 000 cycles    |                      |
|                   | +0.005/0<br>+0.127/0 | 0/-0.005<br>0/-0.127 | 0/-0.020<br>0/-0.508 |          |                |                  |                  |                      |
| —                 | in/mm                |                      |                      | °        | lb/g           | lbf/kN           |                  | lbf-in/Nm            |
| <b>03</b>         | 0.062<br>1,575       | 0.268<br>6,807       | 0.980<br>24,892      | 15       | 0.072<br>33    | 2 360<br>10,50   | 1 470<br>6,54    | 0.5/6<br>0,056/0,678 |
| <b>04</b>         | 0.062<br>1,575       | 0.268<br>6,807       | 0.980<br>24,892      | 15       | 0.072<br>33    | 4 860<br>21,62   | 2 380<br>10,59   | 0.5/6<br>0,056/0,678 |
| <b>05</b>         | 0.062<br>1,575       | 0.268<br>6,807       | 1.270<br>32,258      | 14       | 0.087<br>39    | 7 180<br>31,95   | 2 770<br>12,32   | 1/15<br>0.113/1,695  |
| <b>06</b>         | 0.093<br>2,362       | 0.319<br>8,103       | 1.235<br>31,369      | 8        | 0.136<br>62    | 8 550<br>38,05   | 3 570<br>15,88   | 1/15<br>0.113/1,695  |
| <b>07</b>         | 0.093<br>2,362       | 0.383<br>9,728       | 1.402<br>35,611      | 10       | 0.188<br>83    | 12 000<br>53,4   | 4 800<br>21,35   | 1/15<br>0.113/1,695  |
| <b>08</b>         | 0.093<br>2,362       | 0.445<br>11,303      | 1.589<br>40,361      | 9        | 0.278<br>126   | 19 500<br>86,70  | 7 680<br>34,16   | 1/15<br>0.113/1,695  |
| <b>10</b>         | 0.125<br>3,175       | 0.541<br>13,741      | 1.683<br>42,748      | 12       | 0.424<br>192   | 21 900<br>97,45  | 9 180<br>40,83   | 1/15<br>0.113/1,695  |
| <b>12</b>         | 0.125<br>3,175       | 0.663<br>16,840      | 1.808<br>45,923      | 13       | 0.639<br>290   | 29 300<br>130,38 | 11 600<br>51,60  | 1/15<br>0.113/1,695  |
| <b>14</b>         | 0.156<br>3,962       | 0.777<br>19,736      | 2.121<br>53,873      | 6        | 0.963<br>437   | 34 500<br>153,52 | 13 100<br>58,27  | 1/24<br>0.113/2,712  |
| <b>16</b>         | 0.187<br>4,750       | 1.136<br>28,854      | 2.464<br>62,586      | 12       | 2.546<br>1 150 | 80 300<br>357,31 | 30 400<br>135,22 | 1/24<br>0.113/2,712  |

### 3.23 External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

PHMJ/WAS.. (PHUMJ/XRL.. or 12CM..)¹



|                                |                                                                      |
|--------------------------------|----------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81935                                                             |
| <b>Product standard</b>        | AS 81935/6                                                           |
| <b>Rod end material</b>        | PH13.8 passivated                                                    |
| <b>Bearing</b>                 | WAS..R inch (440C inner ring)<br>EWAS..R inch<br>(PH13.8 inner ring) |

#### Dimensions

| Nominal bore code | Dimensions d           | D                | B                    | C                | A               | d <sub>k</sub>  | r                | H                    | L                |
|-------------------|------------------------|------------------|----------------------|------------------|-----------------|-----------------|------------------|----------------------|------------------|
|                   | 0/-0.0005<br>0/-0,0127 | ±0.010<br>±0.254 | 0/-0.002<br>0/-0,051 | ±0.005<br>±0,127 | ±0.031<br>±0.79 | ≈               | ±0.005<br>±0,127 | UNJF-3A              | ±0.010<br>±0.254 |
| –                 | in/mm                  |                  |                      |                  |                 |                 |                  | –                    | in/mm            |
| <b>03</b>         | 0.1900<br>4,826        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 0.968<br>24,587 | 0.530<br>13,464 | 0.010<br>0,254   | 5/16-24<br>7,94-24   | 1.562<br>39,675  |
| <b>04</b>         | 0.2500<br>6,350        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 0.968<br>24,587 | 0.530<br>13,464 | 0.010<br>0,254   | 5/16-24<br>7,94-24   | 1.562<br>39,675  |
| <b>05</b>         | 0.3125<br>7,938        | 0.900<br>22,860  | 0.437<br>11,100      | 0.327<br>8,306   | 1.187<br>30,150 | 0.566<br>14,381 | 0.010<br>0,254   | 5/16-24<br>7,94-24   | 1.875<br>47,625  |
| <b>06</b>         | 0.3750<br>9,525        | 1.025<br>26,035  | 0.500<br>12,700      | 0.416<br>10,566  | 1.187<br>30,150 | 0.683<br>17,361 | 0.010<br>0,254   | 3/8-24<br>9,52-24    | 1.938<br>49,225  |
| <b>07</b>         | 0.4375<br>11,113       | 1.150<br>29,210  | 0.562<br>14,275      | 0.452<br>11,481  | 1.281<br>32,537 | 0.777<br>19,744 | 0.010<br>0,254   | 7/16-20<br>11,11-20  | 2.125<br>53,975  |
| <b>08</b>         | 0.5000<br>12,700       | 1.337<br>33,960  | 0.625<br>15,875      | 0.515<br>13,081  | 1.468<br>37,287 | 0.871<br>22,130 | 0.010<br>0,254   | 1/2-20<br>12,7-20    | 2.438<br>61,925  |
| <b>10</b>         | 0.6250<br>15,875       | 1.525<br>38,735  | 0.750<br>19,050      | 0.577<br>14,656  | 1.562<br>39,675 | 1.059<br>26,887 | 0.010<br>0,254   | 5/8-18<br>15,87-18   | 2.625<br>66,675  |
| <b>12</b>         | 0.7500<br>19,050       | 1.775<br>45,085  | 0.875<br>22,225      | 0.640<br>16,256  | 1.687<br>42,850 | 1.216<br>30,897 | 0.010<br>0,254   | 3/4-16<br>19,05-16   | 2.875<br>73,025  |
| <b>14</b>         | 0.8750<br>22,225       | 2.025<br>51,435  | 0.875<br>22,225      | 0.765<br>19,431  | 2.000<br>50,800 | 1.325<br>33,655 | 0.010<br>0,254   | 7/8-14<br>22,22-14   | 3.375<br>85,725  |
| <b>16</b>         | 1.0000<br>25,400       | 2.775<br>70,485  | 1.375<br>34,925      | 1.015<br>25,781  | 2.343<br>59,512 | 1.871<br>47,526 | 0.010<br>0,254   | 1 1/4-12<br>31,75-12 | 4.125<br>104,775 |

¹) Parts are delivered and marked with PHUMJ/XRL.. or 12CM.. standard references



## Cross-reference designation system to PHUMJ/XRL.. or 12CM..

Examples: EPHMJ/WAS04GK  
PHMJ/WAS14

Inner ring material

No code 440C (WAS..R bearing)  
E PH13.8 (EWAS..R.. bearing)

Basic designation

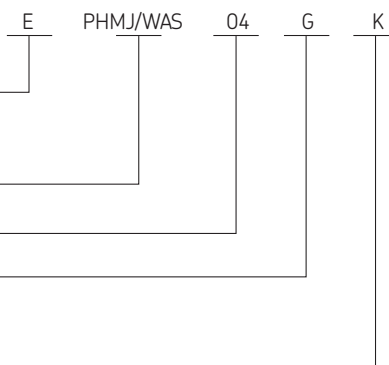
Bore code (multiples of 1/16 inch)

Thread direction

No code Right-hand thread  
G Left-hand thread

Keyway

No code Without keyway  
K With keyway



3.23

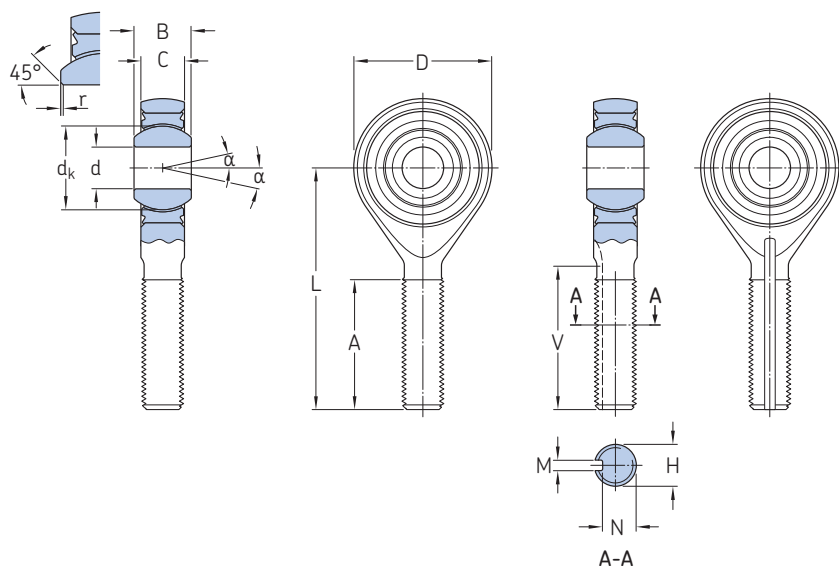


## Dimensions cont., loads and torque

| Nominal bore code | Dimensions           |                      |                      |          | Mass           | Radial loads     | Fatigue          | Starting torque      |
|-------------------|----------------------|----------------------|----------------------|----------|----------------|------------------|------------------|----------------------|
|                   | M                    | N                    | V                    | $\alpha$ | $\approx$      | Ultimate         | 50 000 cycles    |                      |
|                   | +0.005/0<br>+0.127/0 | 0/-0.005<br>0/-0.127 | 0/-0.020<br>0/-0.508 |          |                |                  |                  |                      |
| –                 | in/mm                |                      |                      | °        | lb/g           | lbf/kN           |                  | lbf-in/Nm            |
| <b>03</b>         | 0.062<br>1,575       | 0.268<br>6,807       | 0.980<br>24,892      | 15       | 0.072<br>33    | 2 360<br>10,50   | 1 470<br>6,54    | 0.5/6<br>0,056/0,678 |
| <b>04</b>         | 0.062<br>1,575       | 0.268<br>6,807       | 0.980<br>24,892      | 15       | 0.072<br>33    | 4 860<br>21,62   | 2 380<br>10,59   | 0.5/6<br>0,056/0,678 |
| <b>05</b>         | 0.062<br>1,575       | 0.268<br>6,807       | 1.270<br>32,258      | 14       | 0.087<br>39    | 7 180<br>31,95   | 2 770<br>12,32   | 1/15<br>0,113/1,695  |
| <b>06</b>         | 0.093<br>2,362       | 0.319<br>8,103       | 1.235<br>31,369      | 8        | 0.136<br>62    | 8 550<br>38,05   | 3 570<br>15,88   | 1/15<br>0,113/1,695  |
| <b>07</b>         | 0.093<br>2,362       | 0.383<br>9,728       | 1.402<br>35,611      | 10       | 0.188<br>83    | 12 000<br>53,4   | 4 800<br>21,35   | 1/15<br>0,113/1,695  |
| <b>08</b>         | 0.093<br>2,362       | 0.445<br>11,303      | 1.589<br>40,361      | 9        | 0.278<br>126   | 19 500<br>86,70  | 7 680<br>34,16   | 1/15<br>0,113/1,695  |
| <b>10</b>         | 0.125<br>3,175       | 0.541<br>13,741      | 1.683<br>42,748      | 12       | 0.424<br>192   | 21 900<br>97,45  | 9 180<br>40,83   | 1/15<br>0,113/1,695  |
| <b>12</b>         | 0.125<br>3,175       | 0.663<br>16,840      | 1.808<br>45,923      | 13       | 0.639<br>290   | 29 300<br>130,38 | 11 600<br>51,60  | 1/15<br>0,113/1,695  |
| <b>14</b>         | 0.156<br>3,962       | 0.777<br>19,736      | 2.121<br>53,873      | 6        | 0.963<br>437   | 34 500<br>153,52 | 13 100<br>58,27  | 1/24<br>0,113/2,712  |
| <b>16</b>         | 1.187<br>30,150      | 1.136<br>28,854      | 2.464<br>62,586      | 12       | 2.546<br>1 150 | 80 300<br>357,31 | 30 400<br>135,22 | 1/24<br>0,113/2,712  |

### 3.24 External thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

MJ/NAS.. (UMJ/XRE.. or 12BNM..)¹



|                                |                                                                      |
|--------------------------------|----------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81935                                                             |
| <b>Product standard</b>        | AS 81935/4                                                           |
| <b>Bearing</b>                 | NAS..R inch (440C inner ring)<br>ENAS..R inch<br>(PH13.8 inner ring) |

#### Dimensions

| Nominal Dimensions |                        |                  |                      |                  |                 |                 |                  |                     |                  |
|--------------------|------------------------|------------------|----------------------|------------------|-----------------|-----------------|------------------|---------------------|------------------|
| bore code          | d                      | D                | B                    | C                | A               | d <sub>k</sub>  | r                | H                   | L                |
|                    | 0/-0.0005<br>0/-0.0127 | ±0.010<br>±0.254 | 0/-0.002<br>0/-0.051 | ±0.005<br>±0.127 | ±0.031<br>±0.79 | ≈               | ±0.005<br>±0.127 | UNJF-3A             | ±0.010<br>±0.254 |
| –                  | in/mm                  |                  |                      |                  |                 |                 |                  | –                   | in/mm            |
| <b>03</b>          | 0.1900<br>4,826        | 0.680<br>17,272  | 0.281<br>7,137       | 0.228<br>5,791   | 0.775<br>19,685 | 0.406<br>10,312 | 0.010<br>0,254   | 1/4-28<br>6,35-28   | 1.315<br>33,401  |
| <b>03B</b>         | 0.1900<br>4,826        | 0.680<br>17,272  | 0.281<br>7,137       | 0.228<br>5,791   | 0.775<br>19,685 | 0.406<br>10,312 | 0.010<br>0,254   | 1/4-28<br>6,35-28   | 1.315<br>33,401  |
| <b>04</b>          | 0.2500<br>6,350        | 0.827<br>21,006  | 0.343<br>8,712       | 0.260<br>6,604   | 0.775<br>19,685 | 0.500<br>12,704 | 0.010<br>0,254   | 1/4-28<br>6,35-28   | 1.443<br>36,652  |
| <b>05</b>          | 0.3125<br>7,938        | 0.984<br>24,994  | 0.375<br>9,525       | 0.291<br>7,391   | 1.187<br>30,150 | 0.562<br>14,283 | 0.010<br>0,254   | 5/16-24<br>7,94-24  | 1.948<br>49,479  |
| <b>06</b>          | 0.3750<br>9,525        | 1.131<br>28,727  | 0.406<br>10,312      | 0.322<br>8,179   | 1.187<br>30,150 | 0.625<br>15,872 | 0.010<br>0,254   | 3/8-24<br>9,52-24   | 2.030<br>51,562  |
| <b>07</b>          | 0.4375<br>11,113       | 1.294<br>32,868  | 0.437<br>11,100      | 0.353<br>8,966   | 1.281<br>32,537 | 0.687<br>17,448 | 0.010<br>0,254   | 7/16-20<br>11,11-20 | 2.250<br>57,150  |
| <b>08</b>          | 0.5000<br>12,700       | 1.459<br>37,059  | 0.500<br>12,700      | 0.400<br>10,160  | 1.468<br>37,287 | 0.781<br>19,838 | 0.010<br>0,254   | 1/2-20<br>12,7-20   | 2.544<br>64,618  |
| <b>10</b>          | 0.6250<br>15,875       | 1.763<br>44,780  | 0.625<br>15,875      | 0.510<br>12,954  | 1.562<br>39,675 | 0.978<br>24,584 | 0.010<br>0,254   | 5/8-18<br>15,87-18  | 2.832<br>71,933  |
| <b>12</b>          | 0.7500<br>19,050       | 2.140<br>54,356  | 0.750<br>19,050      | 0.603<br>15,316  | 1.687<br>42,850 | 1.187<br>30,149 | 0.010<br>0,254   | 3/4-16<br>19,05-16  | 3.193<br>81,102  |
| <b>14</b>          | 0.8750<br>22,225       | 2.372<br>60,249  | 0.875<br>22,225      | 0.713<br>18,110  | 2.000<br>50,800 | 1.314<br>33,370 | 0.010<br>0,254   | 7/8-14<br>22,22-14  | 3.677<br>93,396  |
| <b>16</b>          | 1.0000<br>25,400       | 2.681<br>68,097  | 1.000<br>25,400      | 0.807<br>20,498  | 2.100<br>53,340 | 1.500<br>38,099 | 0.010<br>0,254   | 1-12<br>25,4-12     | 3.968<br>100,787 |

¹ Parts are delivered and marked with UMJ/XRE.. and 12BNM.. standard references

### Cross-reference designation system to UMJ/XRE.. or 12BNM..

|                                                    |                               |   |   |        |    |   |   |
|----------------------------------------------------|-------------------------------|---|---|--------|----|---|---|
| Examples:                                          | SEMJ/NAS04GK                  | S | E | MJ/NAS | 04 | G | K |
|                                                    | MJ/NAS14                      |   |   |        |    |   |   |
| <b>Rod end body material and surface treatment</b> |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Cadmium plated 4340 steel     |   |   |        |    |   |   |
| <b>S<sup>2)</sup></b>                              | Zinc-nickel plated 4340 steel |   |   |        |    |   |   |
| <b>Inner ring material</b>                         |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | 440C (NAS..R bearing)         |   |   |        |    |   |   |
| <b>E</b>                                           | PH13.8 (ENAS..R.. bearing)    |   |   |        |    |   |   |
| <b>Basic designation</b>                           |                               |   |   |        |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch)          |                               |   |   |        |    |   |   |
| <b>Thread direction</b>                            |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Right-hand thread             |   |   |        |    |   |   |
| <b>G</b>                                           | Left-hand thread              |   |   |        |    |   |   |
| <b>Keyway</b>                                      |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Without keyway                |   |   |        |    |   |   |
| <b>K</b>                                           | With keyway                   |   |   |        |    |   |   |

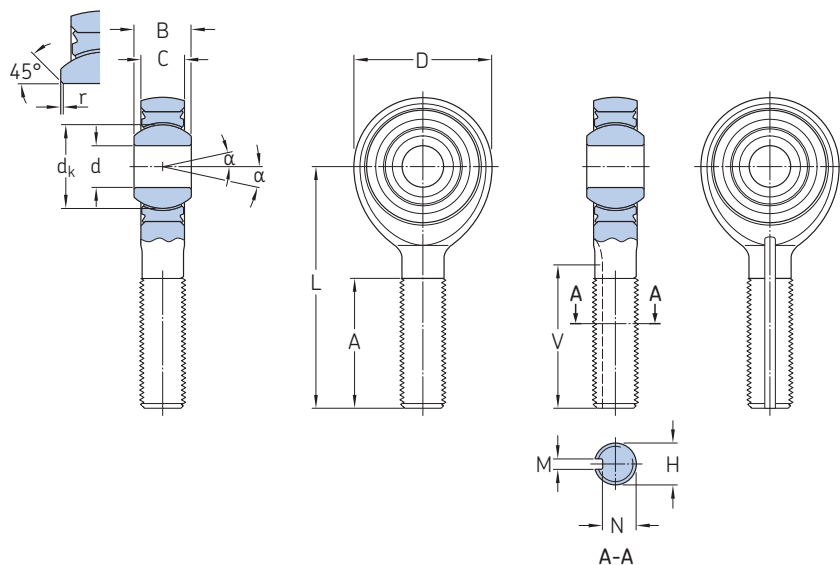
2) SKF option

### Dimensions cont., loads and torque

| Nominal bore code | Dimensions |            | N      | V      | α  | Mass  | Radial loads |               | Starting torque |
|-------------------|------------|------------|--------|--------|----|-------|--------------|---------------|-----------------|
|                   | M          |            |        |        |    |       | Ultimate     | Fatigue       |                 |
|                   | +0.005/0   | N 0/−0.005 | Min    | max    |    | ≈     |              | 50 000 cycles |                 |
|                   | +0.127/0   | 0/−0.127   |        |        |    |       |              |               |                 |
| –                 | in/mm      |            |        |        | °  | lb/g  | lbf/kN       |               | lbf-in/Nm       |
| 03                | 0.062      | 0.207      | 0.876  | 0.896  | 10 | 0.038 | 3 000        | 1 100         | 0.5/6           |
|                   | 1,575      | 5,258      | 22,250 | 22,758 |    | 17    | 13,34        | 4,89          | 0,056/0,678     |
| 03B               | 0.062      | 0.207      | 0.836  | 0.876  | 10 | 0.038 | 3 000        | 1 100         | 0.5/6           |
|                   | 1,575      | 5,258      | 21,234 | 22,250 |    | 17    | 13,34        | 4,89          | 0,056/0,678     |
| 04                | 0.062      | 0.207      | 0.876  | 0.896  | 10 | 0.045 | 5 300        | 1 500         | 0.5/6           |
|                   | 1,575      | 2,258      | 22,250 | 22,758 |    | 20    | 23,6         | 6,67          | 0,056/0,678     |
| 05                | 0.062      | 0.268      | 1.288  | 1.308  | 10 | 0.081 | 8 600        | 2 400         | 1/15            |
|                   | 1,575      | 6,807      | 32,715 | 33,223 |    | 37    | 38,25        | 10,67         | 0,113/1,695     |
| 06                | 0.093      | 0.319      | 1.288  | 1.308  | 9  | 0.120 | 13 000       | 3 600         | 1/15            |
|                   | 2,362      | 8,103      | 32,715 | 33,223 |    | 54    | 57,82        | 16,01         | 0,113/1,695     |
| 07                | 0.093      | 0.383      | 1.382  | 1.402  | 8  | 0.172 | 17 800       | 5 000         | 1/15            |
|                   | 2,362      | 9,728      | 35,103 | 35,611 |    | 78    | 79,17        | 22,24         | 0,113/1,695     |
| 08                | 0.093      | 0.445      | 1.569  | 1.589  | 8  | 0.254 | 24 200       | 6 800         | 1/15            |
|                   | 2,362      | 11,303     | 39,853 | 40,361 |    | 115   | 107,64       | 30,25         | 0,113/1,695     |
| 10                | 0.125      | 0.541      | 1.663  | 1.683  | 8  | 0.455 | 38 500       | 10 800        | 1/15            |
|                   | 3,175      | 13,741     | 42,240 | 42,748 |    | 206   | 171,25       | 48,04         | 0,113/1,695     |
| 12                | 0.125      | 0.663      | 1.788  | 1.808  | 8  | 0.774 | 56 600       | 16 000        | 1/15            |
|                   | 3,175      | 16,840     | 45,415 | 45,923 |    | 351   | 251,76       | 71,17         | 0,113/1,695     |
| 14                | 0.156      | 0.777      | 2.101  | 2.121  | 8  | 1.141 | 77 400       | 21 900        | 1/24            |
|                   | 3,962      | 19,736     | 53,365 | 53,873 |    | 518   | 344,27       | 97,41         | 0,113/2,712     |
| 16                | 0.156      | 0.900      | 2.201  | 2.221  | 9  | 1.646 | 101 400      | 28 600        | 1/24            |
|                   | 3,962      | 22,860     | 55,905 | 56,413 |    | 747   | 451,03       | 127,21        | 0,113/2,712     |

### 3.25 External thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

PHMJ/NAS.. (PHUMJ/XRE.. or 12CNM..)¹)



|                                |                                                                      |
|--------------------------------|----------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81935                                                             |
| <b>Product standard</b>        | AS 81935/8                                                           |
| <b>Rod end material</b>        | PH13.8 passivated                                                    |
| <b>Bearing</b>                 | NAS..R inch (440C inner ring)<br>ENAS..R inch<br>(PH13.8 inner ring) |

#### Dimensions

| Nominal bore code | Dimensions d           | D                | B                    | C                | A               | d <sub>k</sub>  | r                | H                   | L                |
|-------------------|------------------------|------------------|----------------------|------------------|-----------------|-----------------|------------------|---------------------|------------------|
|                   | 0/-0.0005<br>0/-0.0127 | ±0.010<br>±0.254 | 0/-0.002<br>0/-0.051 | ±0.005<br>±0.127 | ±0.031<br>±0.79 | ≈               | ±0.005<br>±0.127 | UNJF-3A             | ±0.010<br>±0.254 |
| –                 | in/mm                  |                  |                      |                  |                 |                 |                  | –                   | in/mm            |
| <b>03</b>         | 0.1900<br>4,826        | 0.680<br>17,272  | 0.281<br>7,137       | 0.228<br>5,791   | 0.775<br>19,685 | 0.406<br>10,312 | 0.010<br>0,254   | 1/4-28<br>6,35-28   | 1.315<br>33,401  |
| <b>04</b>         | 0.2500<br>6,350        | 0.827<br>21,006  | 0.343<br>8,712       | 0.260<br>6,604   | 0.775<br>19,685 | 0.500<br>12,704 | 0.010<br>0,254   | 1/4-28<br>6,35-28   | 1.443<br>36,652  |
| <b>05</b>         | 0.3125<br>7,938        | 0.984<br>24,994  | 0.375<br>9,525       | 0.291<br>7,391   | 1.187<br>30,150 | 0.562<br>14,283 | 0.010<br>0,254   | 5/16-24<br>7,94-24  | 1.948<br>49,479  |
| <b>06</b>         | 0.3750<br>9,525        | 1.131<br>28,727  | 0.406<br>10,312      | 0.322<br>8,179   | 1.187<br>30,150 | 0.625<br>15,872 | 0.010<br>0,254   | 3/8-24<br>9,52-24   | 2.030<br>51,562  |
| <b>07</b>         | 0.4375<br>11,113       | 1.294<br>32,868  | 0.437<br>11,100      | 0.353<br>8,966   | 1.281<br>32,537 | 0.687<br>17,448 | 0.010<br>0,254   | 7/16-20<br>11,11-20 | 2.250<br>57,150  |
| <b>08</b>         | 0.5000<br>12,700       | 1.459<br>37,059  | 0.500<br>12,700      | 0.400<br>10,160  | 1.468<br>37,287 | 0.781<br>19,838 | 0.010<br>0,254   | 1/2-20<br>12,7-20   | 2.544<br>64,618  |
| <b>10</b>         | 0.6250<br>15,875       | 1.763<br>44,780  | 0.625<br>15,875      | 0.510<br>12,954  | 1.562<br>39,675 | 0.968<br>24,584 | 0.010<br>0,254   | 5/8-18<br>15,87-18  | 2.832<br>71,933  |
| <b>12</b>         | 0.7500<br>19,050       | 2.140<br>54,356  | 0.750<br>19,050      | 0.603<br>15,316  | 1.687<br>42,850 | 1.187<br>30,149 | 0.010<br>0,254   | 3/4-16<br>19,05-16  | 3.193<br>81,102  |
| <b>14</b>         | 0.8750<br>22,225       | 2.372<br>60,249  | 0.875<br>22,225      | 0.713<br>18,110  | 2.000<br>50,800 | 1.314<br>33,370 | 0.010<br>0,254   | 7/8-14<br>22,22-14  | 3.677<br>93,396  |
| <b>16</b>         | 1.0000<br>25,400       | 2.681<br>68,097  | 1.000<br>25,400      | 0.807<br>20,498  | 2.100<br>53,340 | 1.500<br>38,099 | 0.010<br>0,254   | 1-12<br>25,4-12     | 3.968<br>100,787 |

¹) Parts are delivered and marked with PHUMJ/XRE.. or 12CNM.. standard references

## Cross-reference designation system to PHMJ/XRE.. or 12CNM..

Examples: EPHMJ/NAS03GK  
PHMJ/NAS14

Inner ring material

No code 440C (NAS..R bearing)  
E PH13.8 (ENAS..R.. bearing)

Basic designation

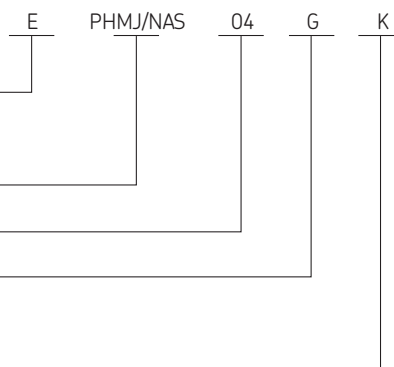
Bore code (multiples of 1/16 inch)

Thread direction

No code Right-hand thread  
G Left-hand thread

Keyway

No code Without keyway  
K With keyway



3.25

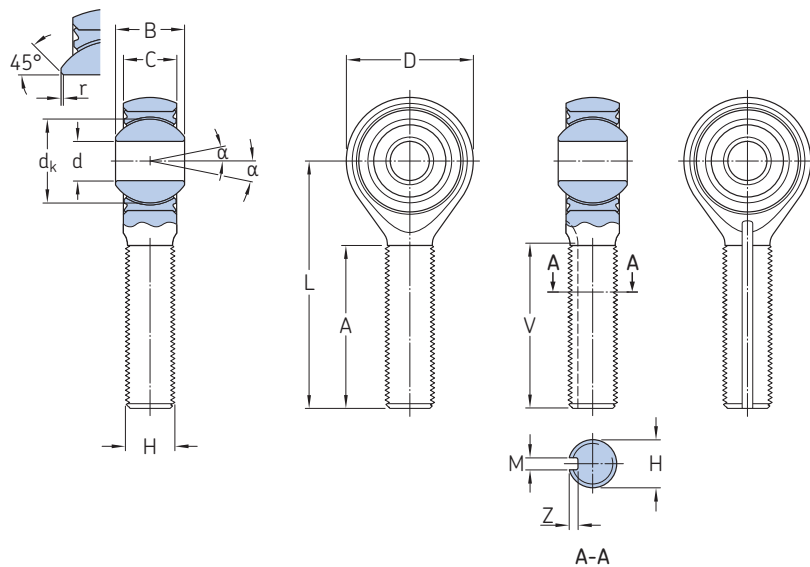


## Dimensions cont., loads and torque

| Nominal bore code | Dimensions |        | N        | V      | α   | Mass  | Radial loads | Fatigue | Starting torque |
|-------------------|------------|--------|----------|--------|-----|-------|--------------|---------|-----------------|
|                   | M          |        |          |        |     |       |              |         |                 |
|                   | +0.005/0   |        | 0/-0.005 | Min    |     |       |              |         |                 |
|                   | +0,127/0   |        | 0/-0,127 |        | max |       |              |         |                 |
| –                 | in/mm      |        |          |        | °   | lb/g  | lbf/kN       |         | lbf-in/Nm       |
| 03                | 0.062      | 0.207  | 0.836    | 0.896  | 10  | 0.038 | 3 000        | 1 100   | 0.5/6           |
|                   | 1,575      | 5,258  | 21,234   | 22,758 |     | 17    | 13,34        | 4,89    | 0,056/0,678     |
| 04                | 0.062      | 0.207  | 0.876    | 0.896  | 10  | 0.045 | 5 300        | 1 500   | 0.5/6           |
|                   | 1,575      | 2,258  | 22,250   | 22,758 |     | 20    | 23,6         | 6,67    | 0,056/0,678     |
| 05                | 0.062      | 0.268  | 1.288    | 1.308  | 10  | 0.081 | 8 600        | 2 400   | 1/15            |
|                   | 1,575      | 6,807  | 32,715   | 33,223 |     | 37    | 38,25        | 10,67   | 0,113/1,695     |
| 06                | 0.093      | 0.319  | 1.288    | 1.308  | 9   | 0.120 | 13 000       | 3 600   | 1/15            |
|                   | 2,362      | 8,103  | 32,715   | 33,223 |     | 54    | 57,82        | 16,01   | 0,113/1,695     |
| 07                | 0.093      | 0.383  | 1.382    | 1.402  | 8   | 0.172 | 17 800       | 5 000   | 1/15            |
|                   | 2,362      | 9,728  | 35,103   | 35,611 |     | 78    | 79,17        | 22,24   | 0,113/1,695     |
| 08                | 0.093      | 0.445  | 1.569    | 1.589  | 8   | 0.254 | 24 200       | 6 800   | 1/15            |
|                   | 2,362      | 11,303 | 39,853   | 40,361 |     | 115   | 107,64       | 30,25   | 0,113/1,695     |
| 10                | 0.125      | 0.541  | 1.663    | 1.683  | 8   | 0.455 | 38 500       | 10 800  | 1/15            |
|                   | 3,175      | 13,741 | 42,240   | 42,748 |     | 206   | 171,25       | 48,04   | 0,113/1,695     |
| 12                | 0.125      | 0.663  | 1.788    | 1.808  | 8   | 0.774 | 56 600       | 16 000  | 1/15            |
|                   | 3,175      | 16,840 | 45,415   | 45,923 |     | 351   | 251,76       | 71,17   | 0,113/1,695     |
| 14                | 0.156      | 0.777  | 2.101    | 2.121  | 8   | 1.141 | 77 400       | 21 900  | 1/24            |
|                   | 3,962      | 19,736 | 53,365   | 53,873 |     | 518   | 344,27       | 97,41   | 0,113/2,712     |
| 16                | 0.156      | 0.900  | 2.201    | 2.221  | 9   | 1.646 | 101 400      | 28 600  | 1/24            |
|                   | 3,962      | 22,860 | 55,905   | 56,413 |     | 747   | 451,03       | 127,21  | 0,113/2,712     |

### 3.26 External thread self-lubricating spherical plain bearing rod end (inch dimensions)

R..M..



|                         |                                        |
|-------------------------|----------------------------------------|
| Technical specification | AS 81935                               |
| Product standard        | NSA 8143                               |
| Liner                   | X1                                     |
| Inner ring              | Corrosion-resistant steel 440C         |
| Outer ring              | Corrosion-resistant steel 17-4PH H1150 |
| Rod end body            | Corrosion-resistant steel 17-4PH H1025 |
| Bearing                 | SW..G inch                             |

#### Dimensions

| Nominal bore code | d                      | B                    | D                | C                | L                | r                    | H        | A                              | d <sub>k</sub>  |
|-------------------|------------------------|----------------------|------------------|------------------|------------------|----------------------|----------|--------------------------------|-----------------|
|                   | 0/-0.0005<br>0/-0,0127 | 0/-0.002<br>0/-0,051 | ±0.010<br>±0,254 | ±0.005<br>±0,127 | ±0.010<br>±0,254 | +0.010/0<br>+0,254/0 | UNJF-3A  | +0.060/-0.030<br>+1,524/-0,762 | ≈               |
| –                 | in/mm                  |                      |                  |                  |                  |                      | –        | in/mm                          |                 |
| 03                | 0.1900<br>4,826        | 0.437<br>11,100      | 0.806<br>20,472  | 0.337<br>8,560   | 1.562<br>39,675  | 0.005<br>0,127       | 5/16-24  | 1.000<br>25,400                | 0.531<br>13,487 |
| 04                | 0.2500<br>6,350        | 0.437<br>11,100      | 0.806<br>20,472  | 0.337<br>8,560   | 1.562<br>39,675  | 0.005<br>0,127       | 5/16-24  | 1.000<br>25,400                | 0.531<br>13,487 |
| 05                | 0.3125<br>7,938        | 0.437<br>11,100      | 0.900<br>22,860  | 0.327<br>8,306   | 1.875<br>47,625  | 0.005<br>0,127       | 5/16-24  | 1.062<br>26,974                | 0.593<br>15,062 |
| 051               | 0.3125<br>7,938        | 0.437<br>11,100      | 0.900<br>22,860  | 0.327<br>8,306   | 2.270<br>57,655  | 0.005<br>0,127       | 5/16-24  | 1.457<br>37,000                | 0.593<br>15,062 |
| 06                | 0.3750<br>9,525        | 0.500<br>12,700      | 1.025<br>26,035  | 0.416<br>10,566  | 1.938<br>49,225  | 0.005<br>0,127       | 3/16-24  | 1.250<br>31,750                | 0.687<br>17,449 |
| 061               | 0.3750<br>9,525        | 0.500<br>12,700      | 1.025<br>26,035  | 0.416<br>10,566  | 2.341<br>59,475  | 0.005<br>0,127       | 3/16-24  | 1.653<br>42,000                | 0.687<br>17,449 |
| 07                | 0.4375<br>11,113       | 0.562<br>14,274      | 1.150<br>29,210  | 0.452<br>11,481  | 2.125<br>53,975  | 0.005<br>0,127       | 7/16-20  | 1.375<br>34,925                | 0.781<br>19,837 |
| 08                | 0.5000<br>12,700       | 0.625<br>15,875      | 1.337<br>33,960  | 0.515<br>13,081  | 2.438<br>61,925  | 0.005<br>0,127       | 1/2-20   | 1.500<br>38,100                | 0.875<br>22,225 |
| 081               | 0.5000<br>12,700       | 0.625<br>15,875      | 1.337<br>33,960  | 0.515<br>13,081  | 3.044<br>77,325  | 0.005<br>0,127       | 1/2-20   | 2.126<br>54,000                | 0.875<br>22,225 |
| 10                | 0.6250<br>15,875       | 0.750<br>19,050      | 1.525<br>38,735  | 0.577<br>14,656  | 2.625<br>66,675  | 0.005<br>0,127       | 5/8-20   | 1.625<br>41,275                | 1.062<br>26,974 |
| 12                | 0.7500<br>19,050       | 0.875<br>22,225      | 1.775<br>45,085  | 0.640<br>16,256  | 2.875<br>73,025  | 0.005<br>0,127       | 3/4-16   | 1.750<br>44,450                | 1.250<br>31,750 |
| 14                | 0.8750<br>22,225       | 0.875<br>22,225      | 2.025<br>51,435  | 0.765<br>19,431  | 3.375<br>85,725  | 0.005<br>0,127       | 7/8-14   | 1.875<br>47,625                | 1.375<br>34,925 |
| 16                | 1.0000<br>25,400       | 1.375<br>34,925      | 2.775<br>70,485  | 1.015<br>25,781  | 4.125<br>104,775 | 0.005<br>0,127       | 1 1/4-12 | 2.123<br>53,915                | 1.937<br>49,200 |

## Designation system

Examples: R03MLCK  
R12MR

R 03 M L C K

### Basic designation

Bore code (multiples of 1/16 inch)

### Thread direction

R Right-hand thread  
L Left-hand thread

### Surface treatment of rod end body

No code No treatment  
C<sup>1)</sup> Cadmium plated  
J<sup>1)</sup> Zinc-nickel plated

### Keyway

No code Without keyway  
K With keyway

<sup>1)</sup> SKF option

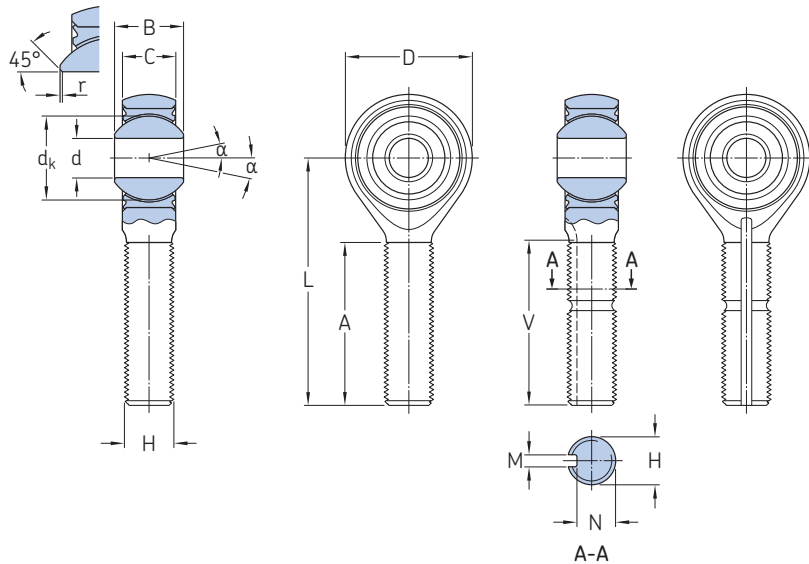
## Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>Z<br>+0.005/0<br>+0.127/0 | M<br>+0.005/0<br>+0.127/0 | V<br>+0.010/-0.030<br>+0.254/-0.762 | $\alpha$ | Mass<br>≈        | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque      |
|-------------------|-----------------------------------------|---------------------------|-------------------------------------|----------|------------------|--------------------------|--------------------------|----------------------|
| –                 | in/mm                                   |                           |                                     | °        | lb/g             | lbf/kN                   |                          | lbf-in/Nm            |
| 03                | 0.052<br>1,320                          | 0.062<br>1,575            | 0.920<br>23,368                     | 17       | 0.06<br>27,21    | 4 800<br>21,35           | 1470.25<br>6,54          | 0.5/6<br>0,056/0,678 |
| 04                | 0.052<br>1,320                          | 0.062<br>1,575            | 0.920<br>23,368                     | 17       | 0.06<br>27,21    | 4 800<br>21,35           | 2380.73<br>10,59         | 0.5/6<br>0,056/0,678 |
| 05                | 0.052<br>1,320                          | 0.062<br>1,575            | 0.980<br>24,892                     | 14       | 0.07<br>31,75    | 5 500<br>24,47           | 2769.65<br>12,32         | 1/10<br>0,113/1,129  |
| 051               | 0.052<br>1,320                          | 0.062<br>1,575            | 0.980<br>24,892                     | 14       | 0.07<br>31,75    | 5 500<br>24,47           | 2769.65<br>12,32         | 1/10<br>0,113/1,129  |
| 06                | 0.064<br>1,625                          | 0.093<br>2,362            | 1.170<br>29,718                     | 10       | 0.11<br>49,89    | 7 000<br>31,14           | 3569.97<br>15,88         | 1/10<br>0,113/1,129  |
| 061               | 0.064<br>1,625                          | 0.093<br>2,362            | 1.170<br>29,718                     | 10       | 0.11<br>49,89    | 7 000<br>31,14           | 3569.97<br>15,88         | 1/10<br>0,113/1,129  |
| 07                | 0.067<br>1,701                          | 0.093<br>2,362            | 1.275<br>32,385                     | 12       | 0.15<br>68,03    | 8 100<br>36,03           | 4799.67<br>21,35         | 1/10<br>0,113/1,129  |
| 08                | 0.064<br>1,625                          | 0.093<br>2,362            | 1.400<br>35,560                     | 9        | 0.25<br>113,39   | 14 200<br>63,16          | 7679.48<br>34,16         | 1/10<br>0,113/1,129  |
| 081               | 0.064<br>1,625                          | 0.093<br>2,362            | 1.400<br>35,560                     | 9        | 0.25<br>113,39   | 14 200<br>63,16          | 7679.48<br>34,16         | 1/10<br>0,113/1,129  |
| 10                | 0.084<br>2,133                          | 0.125<br>3,175            | 1.515<br>38,481                     | 12       | 0.37<br>167,82   | 16 150<br>71,84          | 9178.95<br>40,83         | 1/10<br>0,113/1,129  |
| 12                | 0.087<br>2,209                          | 0.125<br>3,175            | 1.625<br>41,275                     | 14       | 0.58<br>263,08   | 21 000<br>93,41          | 11 600,14<br>51,60       | 1/10<br>0,113/1,129  |
| 14                | 0.098<br>2,489                          | 0.156<br>3,962            | 1.730<br>43,942                     | 7        | 0.79<br>358,33   | 26 000<br>115,65         | 13099.62<br>58,27        | 2/16<br>0,226/1,807  |
| 16                | 0.114<br>2,895                          | 0.187<br>4,750            | 1.960<br>49,784                     | 15       | 2.30<br>1 043,26 | 55 500<br>246,88         | 30400.92<br>135,23       | 2/16<br>0,226/1,807  |

### 3.27 External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

EMJ/RL..R

|                         |                             |
|-------------------------|-----------------------------|
| Technical specification | AS 81820<br>for the bearing |
| Product standard        | –                           |
| Bearing                 | WAS..R inch                 |



3.27

#### Dimensions

| Nominal bore code | Dash number<br>multiples of<br>1/16 inch | Dimensions<br>d<br>0/-0.0005<br>0/-0.0127 | D<br>±0.010<br>±0.254 | B<br>0/-0.002<br>0/-0.051 | C<br>±0.005<br>±0.127 | A<br>+0.06/-0.03<br>+1.524/-0.762 | V<br>0/-0.020<br>0/-0.508 | d <sub>k</sub><br>≈ | r<br>±0.005<br>±0.127 | H<br>UNJF-3A         |
|-------------------|------------------------------------------|-------------------------------------------|-----------------------|---------------------------|-----------------------|-----------------------------------|---------------------------|---------------------|-----------------------|----------------------|
| –                 |                                          | in/mm                                     |                       |                           |                       |                                   |                           |                     |                       | –                    |
| <b>4,83</b>       | <b>03</b>                                | 0.1900<br>4,826                           | 0.806<br>20,472       | 0.437<br>11,100           | 0.337<br>8,56         | 1.000<br>25,400                   | 1.000<br>25,400           | 0.530<br>13,464     | 0.010<br>0,254        | 5/16-24<br>7,94-24   |
| <b>6,35</b>       | <b>04</b>                                | 0.2500<br>6,350                           | 0.806<br>20,472       | 0.437<br>11,100           | 0.337<br>8,56         | 1.000<br>25,400                   | 1.000<br>25,400           | 0.530<br>13,464     | 0.010<br>0,254        | 5/16-24<br>7,94-24   |
| <b>7,94</b>       | <b>05</b>                                | 0.3125<br>7,938                           | 0.900<br>22,860       | 0.437<br>11,100           | 0.327<br>8,306        | 1.062<br>26,975                   | 1.062<br>26,975           | 0.566<br>14,381     | 0.010<br>0,254        | 5/16-24<br>7,94-24   |
| <b>9,52</b>       | <b>06</b>                                | 0.3750<br>9,525                           | 1.025<br>26,035       | 0.500<br>12,700           | 0.416<br>10,566       | 1.250<br>31,750                   | 1.250<br>31,750           | 0.683<br>17,361     | 0.010<br>0,254        | 3/8-24<br>9,52-24    |
| <b>11,11</b>      | <b>07</b>                                | 0.4375<br>11,113                          | 1.150<br>29,210       | 0.562<br>14,275           | 0.452<br>11,481       | 1.375<br>34,925                   | 1.375<br>34,925           | 0.777<br>19,744     | 0.010<br>0,254        | 7/16-20<br>11,11-20  |
| <b>12,7</b>       | <b>08</b>                                | 0.5000<br>12,700                          | 1.337<br>33,960       | 0.625<br>15,875           | 0.515<br>13,081       | 1.500<br>38,100                   | 1.500<br>38,100           | 0.871<br>22,130     | 0.010<br>0,254        | 1/2-20<br>12,7-20    |
| <b>15,87</b>      | <b>10</b>                                | 0.6250<br>15,875                          | 1.525<br>38,735       | 0.750<br>19,050           | 0.577<br>14,656       | 1.625<br>41,275                   | 1.625<br>41,275           | 1.059<br>26,887     | 0.010<br>0,254        | 5/8-18<br>15,87-18   |
| <b>19,05</b>      | <b>12</b>                                | 0.7500<br>19,050                          | 1.775<br>45,085       | 0.875<br>22,225           | 0.640<br>16,256       | 1.750<br>44,450                   | 1.750<br>44,450           | 1.216<br>30,897     | 0.010<br>0,254        | 3/4-16<br>19,05-16   |
| <b>22,22</b>      | <b>14</b>                                | 0.8750<br>22,225                          | 2.025<br>51,435       | 0.875<br>22,225           | 0.765<br>19,431       | 1.875<br>47,625                   | 1.875<br>47,625           | 1.325<br>33,655     | 0.010<br>0,254        | 7/8-14<br>22,22-14   |
| <b>25,4</b>       | <b>16</b>                                | 1.0000<br>25,400                          | 2.775<br>70,485       | 1.375<br>34,925           | 1.015<br>25,781       | 2.125<br>53,975                   | 2.125<br>53,975           | 1.871<br>47,526     | 0.010<br>0,254        | 1 1/4-12<br>31,75-12 |



## Designation system

|                                                    |                                        |   |        |      |   |   |   |   |   |
|----------------------------------------------------|----------------------------------------|---|--------|------|---|---|---|---|---|
| Examples:                                          | XEMJ/RL 6,35RGZKX<br>EMJ/RL22,22       | X | EMJ/RL | 6,35 | R | G | Z | K | X |
| <b>Rod end body material and surface treatment</b> |                                        |   |        |      |   |   |   |   |   |
| <b>No code</b>                                     | Cadmium plated 30NCD16 steel           |   |        |      |   |   |   |   |   |
| <b>S</b>                                           | Zinc-nickel plated 30NCD16 steel       |   |        |      |   |   |   |   |   |
| <b>X</b>                                           | Corrosion-resistant steel 17-4PH H1025 |   |        |      |   |   |   |   |   |
| <b>T<sup>1)</sup></b>                              | Anodized titanium                      |   |        |      |   |   |   |   |   |
| <b>Basic designation</b>                           |                                        |   |        |      |   |   |   |   |   |
| <b>Bore code</b>                                   |                                        |   |        |      |   |   |   |   |   |
| <b>Thread direction</b>                            |                                        |   |        |      |   |   |   |   |   |
| <b>No code</b>                                     | Right-hand thread                      |   |        |      |   |   |   |   |   |
| <b>G</b>                                           | Left-hand thread                       |   |        |      |   |   |   |   |   |
| <b>Locating groove</b>                             |                                        |   |        |      |   |   |   |   |   |
| <b>No code</b>                                     | Without locating groove                |   |        |      |   |   |   |   |   |
| <b>Z</b>                                           | With locating groove                   |   |        |      |   |   |   |   |   |
| <b>Keyway</b>                                      |                                        |   |        |      |   |   |   |   |   |
| <b>No code</b>                                     | Without keyway                         |   |        |      |   |   |   |   |   |
| <b>K</b>                                           | With keyway                            |   |        |      |   |   |   |   |   |
| <b>Starting torque</b>                             |                                        |   |        |      |   |   |   |   |   |
| <b>No code</b>                                     | Standard                               |   |        |      |   |   |   |   |   |
| <b>X</b>                                           | Reduced                                |   |        |      |   |   |   |   |   |

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body

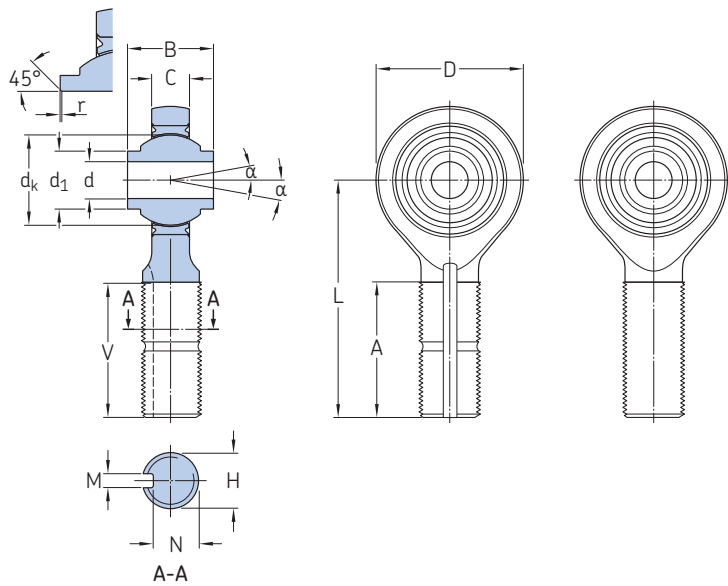
## Dimensions cont., loads and torque

| Nominal bore code | Dash number | Dimensions       |                      |                      |          | Mass          | Radial loads           | Fatigue                | Starting torque      |                     |
|-------------------|-------------|------------------|----------------------|----------------------|----------|---------------|------------------------|------------------------|----------------------|---------------------|
|                   |             | L                | M                    | N                    | $\alpha$ | $\approx$     | Ultimate <sup>1)</sup> | 10 <sup>6</sup> cycles | Standard             | Reduced             |
|                   |             | ±0.010<br>±0,254 | +0.005/0<br>+0,127/0 | 0/-0.005<br>0/-0,127 |          |               |                        |                        |                      |                     |
|                   |             | in/mm            |                      |                      | °        | lb/g          | lbf/kN                 |                        | lbf-in/Nm            |                     |
| <b>4,83</b>       | <b>03</b>   | 1.562<br>39,675  | 0.062<br>1,575       | 0.260<br>6,604       | 16       | 0.07<br>30    | 6 195<br>27,56         | 1 052<br>4,68          | 0.53/10<br>0,06/1,12 | 1.1 max<br>0,12 max |
| <b>6,35</b>       | <b>04</b>   | 1.562<br>39,675  | 0.062<br>1,575       | 0.260<br>6,604       | 16       | 0.07<br>30    | 6 195<br>27,56         | 1 052<br>4,68          | 0.53/10<br>0,06/1,12 | 1.1 max<br>0,12 max |
| <b>7,94</b>       | <b>05</b>   | 1.875<br>47,625  | 0.062<br>1,575       | 0.260<br>6,604       | 15       | 0.08<br>35    | 7 585<br>33,74         | 1 090<br>4,85          | 1/10<br>0,11/1,12    | 2 max<br>0,22 max   |
| <b>9,52</b>       | <b>06</b>   | 1.938<br>49,225  | 0.093<br>2,362       | 0.311<br>7,900       | 9        | 0.12<br>55    | 8 940<br>39,77         | 1 513<br>6,73          | 1/10<br>0,11/1,12    | 2 max<br>0,22 max   |
| <b>11,11</b>      | <b>07</b>   | 2.125<br>53,975  | 0.093<br>2,362       | 0.370<br>9,400       | 11       | 0.17<br>75    | 9 595<br>42,68         | 1 920<br>8,54          | 1/10<br>0,11/1,12    | 2 max<br>0,22 max   |
| <b>12,7</b>       | <b>08</b>   | 2.438<br>61,925  | 0.093<br>2,362       | 0.436<br>11,074      | 9        | 0.28<br>127   | 18 750<br>83,40        | 3 069<br>13,65         | 1/10<br>0,11/1,12    | 2 max<br>0,22 max   |
| <b>15,87</b>      | <b>10</b>   | 2.625<br>66,675  | 0.125<br>3,175       | 0.541<br>13,741      | 12       | 0.38<br>172   | 20 680<br>91,99        | 3 480<br>15,48         | 1/10<br>0,11/1,12    | 2 max<br>0,22 max   |
| <b>19,05</b>      | <b>12</b>   | 2.875<br>73,025  | 0.125<br>3,175       | 0.663<br>16,840      | 13       | 0.58<br>263   | 27 795<br>123,64       | 4 586<br>20,40         | 1/10<br>0,11/1,12    | 2 max<br>0,22 max   |
| <b>22,22</b>      | <b>14</b>   | 3.375<br>85,725  | 0.156<br>3,962       | 0.777<br>19,735      | 6        | 0.81<br>370   | 31 725<br>141,12       | 5 348<br>23,79         | 2/15.9<br>0,23/1,8   | 4.1 max<br>0,46 max |
| <b>25,4</b>       | <b>16</b>   | 4.125<br>104,775 | 0.187<br>4,750       | 1.136<br>28,854      | 12       | 2.40<br>1 100 | 71 745<br>319,14       | 11 990<br>53,33        | 2/15.9<br>0,23/1,8   | 4.1 max<br>0,46 max |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

### 3.28 External thread inserted self-lubricating spherical plain bearing rod end (inch dimensions)

EMJ/RT..R



|                         |             |
|-------------------------|-------------|
| Technical specification | –           |
| Product standard        | –           |
| Bearing                 | XRT..R inch |

3.28

#### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions | d                      | D                              | B                    | C                | A                            | V                    | d <sub>k</sub>      | d <sub>1</sub>      | r                  | H                    |
|-------------------|------------------------------------|------------|------------------------|--------------------------------|----------------------|------------------|------------------------------|----------------------|---------------------|---------------------|--------------------|----------------------|
|                   |                                    |            | 0/-0.0005<br>0/-0.0127 | +0.035/-0.010<br>+0.889/-0.254 | 0/-0.005<br>0/-0.127 | ±0.005<br>±0.127 | +0.06/-0.03<br>+1.524/-0.762 | 0/-0.020<br>0/-0.508 | d <sub>k</sub><br>≈ | d <sub>1</sub><br>≈ | +0.012/0<br>+0.3/0 | UNJF-3A              |
| –                 |                                    | in/mm      |                        |                                |                      |                  |                              |                      |                     |                     |                    | –                    |
| <b>4,83</b>       | <b>03</b>                          |            | 0.1900<br>4,826        | 0.750<br>19,050                | 0.500<br>12,700      | 0.220<br>5,588   | 1.000<br>25,400              | 1.000<br>25,400      | 0.437<br>11,100     | 0.315<br>8,001      | 0.004<br>0,100     | 5/16-24<br>7,94-24   |
| <b>6,35</b>       | <b>04</b>                          |            | 0.2500<br>6,350        | 1.000<br>25,400                | 0.593<br>15,062      | 0.265<br>6,731   | 1.250<br>31,750              | 1.250<br>31,750      | 0.594<br>15,080     | 0.386<br>9,804      | 0.004<br>0,100     | 3/8-24<br>9,52-24    |
| <b>7,94</b>       | <b>05</b>                          |            | 0.3125<br>7,938        | 1.125<br>28,575                | 0.813<br>20,650      | 0.355<br>9,017   | 1.375<br>34,925              | 1.375<br>34,925      | 0.781<br>19,838     | 0.512<br>13,005     | 0.004<br>0,100     | 7/16-20<br>11,11-20  |
| <b>9,52</b>       | <b>06</b>                          |            | 0.3750<br>9,525        | 1.125<br>28,575                | 0.813<br>20,650      | 0.355<br>9,017   | 1.375<br>34,925              | 1.375<br>34,925      | 0.781<br>19,838     | 0.532<br>13,513     | 0.004<br>0,100     | 7/16-20<br>11,11-20  |
| <b>11,11</b>      | <b>07</b>                          |            | 0.4375<br>11,113       | 1.312<br>33,325                | 0.875<br>22,225      | 0.355<br>9,017   | 1.500<br>38,100              | 1.500<br>38,100      | 0.866<br>22,000     | 0.620<br>15,748     | 0.004<br>0,100     | 1/2-20<br>12,7-20    |
| <b>12,7</b>       | <b>08</b>                          |            | 0.5000<br>12,700       | 1.500<br>38,100                | 0.937<br>23,799      | 0.411<br>10,439  | 1.625<br>41,275              | 1.625<br>41,275      | 0.984<br>25,000     | 0.728<br>18,491     | 0.004<br>0,100     | 5/8-18<br>15,87-18   |
| <b>15,87</b>      | <b>10</b>                          |            | 0.6250<br>15,875       | 1.750<br>44,450                | 1.200<br>30,480      | 0.577<br>14,656  | 1.750<br>44,45               | 1.750<br>44,45       | 1.240<br>31,500     | 0.857<br>21,768     | 0.004<br>0,100     | 3/4-16<br>19,05-16   |
| <b>19,05</b>      | <b>12</b>                          |            | 0.7500<br>19,050       | 2.000<br>50,800                | 1.280<br>32,512      | 0.630<br>16,002  | 1.875<br>47,625              | 1.875<br>47,625      | 1.339<br>34,000     | 0.963<br>24,460     | 0.004<br>0,100     | 7/8-14<br>22,22-14   |
| <b>22,22</b>      | <b>14</b>                          |            | 0.8750<br>22,225       | 2.200<br>55,880                | 1.400<br>35,560      | 0.635<br>16,129  | 2.000<br>50,800              | 2.000<br>50,800      | 1.531<br>38,887     | 1.122<br>28,500     | 0.004<br>0,100     | 7/8-14<br>22,22-14   |
| <b>25,4</b>       | <b>16</b>                          |            | 1.0000<br>25,400       | 2.750<br>69,850                | 1.875<br>47,625      | 0.845<br>21,463  | 2.125<br>53,975              | 2.125<br>53,975      | 1.875<br>47,625     | 1.272<br>32,309     | 0.004<br>0,100     | 1 1/4-12<br>31,75-12 |

## Designation system

Examples: XEMJ/RT 6,35RGZKX  
EMJ/RT11,11R

### Rod end body material and surface treatment

**No code** Cadmium plated 30NCD16 steel  
**S** Zinc-nickel plated 30NCD16 steel  
**X** Corrosion-resistant steel 17-4PH H1025  
**T<sup>1)</sup>** Anodized titanium

### Basic designation

#### Bore code

#### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

#### Locating groove

**No code** Without locating groove  
**Z** With locating groove

#### Keyway

**No code** Without keyway  
**K** With keyway

#### Starting torque

**No code** Standard  
**X** Reduced

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body

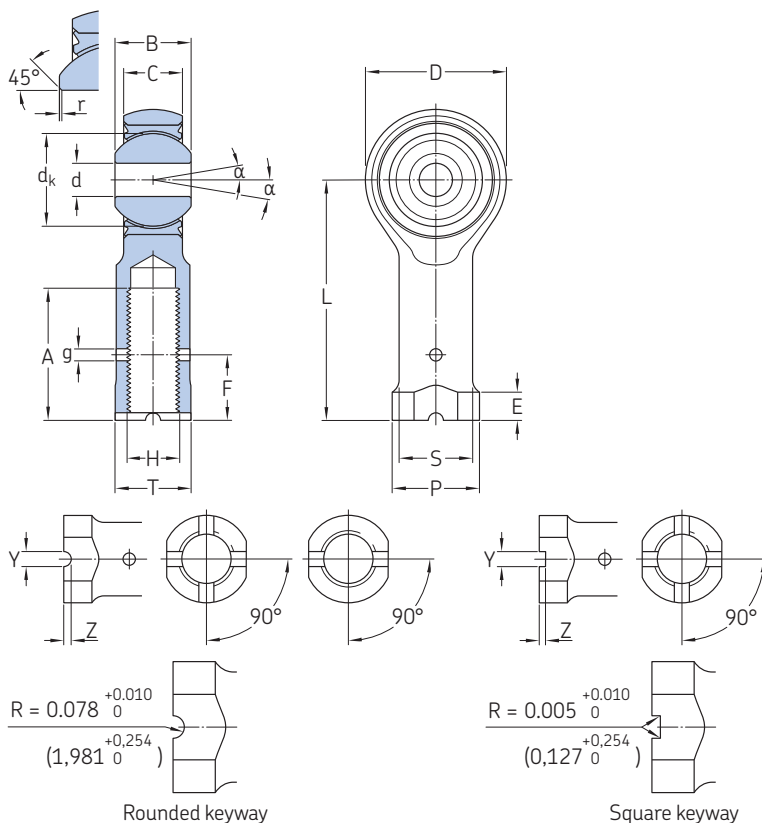
## Dimensions cont., loads and torque

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions<br>L<br>±0.010<br>±0,254 | M<br>±0.005/0<br>+0,127/0 | N<br>0/-0.005<br>0/-0,127 | α  | Mass<br>≈   | Radial loads<br>Ultimate <sup>1)</sup> | Fatigue<br>10 <sup>6</sup> cycles | Starting torque<br>Standard | Reduced           |
|-------------------|---------------------------------------|-------------------------------------|---------------------------|---------------------------|----|-------------|----------------------------------------|-----------------------------------|-----------------------------|-------------------|
| –                 |                                       | in/mm                               |                           |                           | °  | lb/g        | lbf/kN                                 |                                   | lbf-in/Nm                   |                   |
| <b>4,83</b>       | <b>03</b>                             | 1.500<br>38,100                     | 0.062<br>1,575            | 0.260<br>6,604            | 15 | 0.06<br>27  | 4 800<br>21,35                         | 762<br>3,39                       | 0.53/5<br>0,06/0,56         | 1 max<br>0,12 max |
| <b>6,35</b>       | <b>04</b>                             | 1.938<br>49,225                     | 0.093<br>2,362            | 0.311<br>7,899            | 24 | 0.11<br>50  | 8 185<br>36,41                         | 1 311<br>5,83                     | 0.53/5<br>0,06/0,56         | 1 max<br>0,12 max |
| <b>7,94</b>       | <b>05</b>                             | 2.125<br>53,975                     | 0.093<br>2,362            | 0.370<br>9,400            | 23 | 0.16<br>73  | 8 620<br>38,34                         | 1 414<br>6,29                     | 0.7/7<br>0,08/0,8           | 2 max<br>0,22 max |
| <b>9,52</b>       | <b>06</b>                             | 2.125<br>53,975                     | 0.093<br>2,362            | 0.370<br>9,400            | 22 | 0.16<br>73  | 8 620<br>38,34                         | 1 414<br>6,29                     | 0.88/9<br>0,10/1,02         | 2 max<br>0,22 max |
| <b>11,11</b>      | <b>07</b>                             | 2.438<br>61,925                     | 0.093<br>2,362            | 0.436<br>11,074           | 22 | 0.25<br>114 | 13 025<br>57,94                        | 2 104<br>9,36                     | 0.88/9<br>0,10/1,02         | 2 max<br>0,22 max |
| <b>12,7</b>       | <b>08</b>                             | 2.625<br>66,675                     | 0.125<br>3,175            | 0.541<br>13,741           | 20 | 0.41<br>186 | 18 165<br>80,80                        | 2 947<br>13,11                    | 0.88/9<br>0,10/1,02         | 2 max<br>0,22 max |
| <b>15,87</b>      | <b>10</b>                             | 2.875<br>73,025                     | 0.125<br>3,175            | 0.663<br>16,840           | 20 | 0.64<br>290 | 24 010<br>106,80                       | 3 973<br>17,67                    | 1/12,4<br>0,11/1,4          | 2 max<br>0,22 max |
| <b>19,05</b>      | <b>12</b>                             | 3.375<br>85,725                     | 0.156<br>3,962            | 0.777<br>19,735           | 19 | 0.92<br>417 | 26 990<br>120,06                       | 5 052<br>22,47                    | 1/12,4<br>0,11/1,4          | 2 max<br>0,22 max |
| <b>22,22</b>      | <b>14</b>                             | 3.750<br>95,250                     | 0.156<br>3,962            | 0.777<br>19,735           | 19 | 1.11<br>508 | 28 880<br>128,46                       | 5 295<br>23,55                    | 2.21/18<br>0,25/2,04        | 4 max<br>0,46 max |
| <b>25,4</b>       | <b>16</b>                             | 4.125<br>104,775                    | 0.187<br>4,750            | 1.136<br>28,854           | 21 | 2.14<br>970 | 60 230<br>267,92                       | 9 858<br>43,85                    | 2.21/18<br>0,25/2,04        | 4 max<br>0,46 max |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

### 3.29 Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

FJ/WAS.. (UFJ/XRL.. or 12BF..) <sup>1)</sup> bore code **03** to **07**



|                                |                                                                   |
|--------------------------------|-------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81935                                                          |
| <b>Product standard</b>        | AS 81935/2                                                        |
| <b>Bearing</b>                 | WAS..R inch (440C inner ring)<br>EWAS..R inch (PH13.8 inner ring) |

| Keyway type | Bore code | Keyway shape | Number of slots |
|-------------|-----------|--------------|-----------------|
| K           | ≤ 06      | Rounded      | 2               |
|             | 07 to 08  | Rounded      | 4               |
|             | ≥ 10      | Square       | 4               |
| W           | All       | Square       | 4               |

#### Dimensions

| Nominal bore code | Dimensions<br>d<br>0/-0.0005<br>0/-0.0127 | D<br>±0.010<br>±0.254 | B<br>0/-0.002<br>0/-0.051 | C<br>±0.005<br>±0.127 | A<br>Min        | d <sub>k</sub><br>≈ | r<br>±0.005<br>±0.127 | H<br>UNJF-3B        |
|-------------------|-------------------------------------------|-----------------------|---------------------------|-----------------------|-----------------|---------------------|-----------------------|---------------------|
| –                 | in/mm                                     | –                     |                           |                       |                 |                     |                       | –                   |
| <b>03</b>         | 0.1900<br>4,826                           | 0.806<br>20,472       | 0.437<br>11,100           | 0.337<br>8,56         | 0.750<br>19,050 | 0.530<br>13,464     | 0.010<br>0,254        | 5/16-24<br>7,94-24  |
| <b>04</b>         | 0.2500<br>6,350                           | 0.806<br>20,472       | 0.437<br>11,100           | 0.337<br>8,56         | 0.750<br>19,050 | 0.530<br>13,464     | 0.010<br>0,254        | 5/16-24<br>7,94-24  |
| <b>05</b>         | 0.3125<br>7,938                           | 0.900<br>22,860       | 0.437<br>11,100           | 0.327<br>8,306        | 0.875<br>22,225 | 0.566<br>14,381     | 0.010<br>0,254        | 3/8-24<br>9,52-24   |
| <b>06</b>         | 0.3750<br>9,525                           | 1.025<br>26,035       | 0.500<br>12,700           | 0.416<br>10,566       | 1.000<br>25,400 | 0.683<br>17,361     | 0.010<br>0,254        | 3/8-24<br>9,52-24   |
| <b>07</b>         | 0.4375<br>11,113                          | 1.150<br>29,210       | 0.562<br>14,275           | 0.452<br>11,481       | 1.125<br>28,575 | 0.777<br>19,744     | 0.010<br>0,254        | 7/16-20<br>11,11-20 |

#### Dimensions cont.

| Nominal bore code | Dimensions<br>g<br>≈ | L<br>±0.010<br>±0.254 | P<br>≈          | F<br>±0.020<br>±0.508 | S<br>±0.010<br>±0.254 | T<br>+0.002/-0.010<br>+0.051/-0.254 | E<br>+0.010/-0.062<br>+0.254/-1,575 | Z <sup>2)</sup><br>+0.005/0<br>+0.127/0 | Y <sup>2)</sup><br>+0.005/0<br>+0.127/0 |
|-------------------|----------------------|-----------------------|-----------------|-----------------------|-----------------------|-------------------------------------|-------------------------------------|-----------------------------------------|-----------------------------------------|
| –                 | in/mm                |                       |                 |                       |                       |                                     |                                     |                                         |                                         |
| <b>03</b>         | 0.07<br>1,778        | 1.375<br>34,925       | 0.500<br>12,700 | 0.375<br>9,525        | 0.422<br>10,719       | 0.437<br>11,100                     | 0.188<br>4,775                      | –                                       | –                                       |
| <b>04</b>         | 0.07<br>1,778        | 1.469<br>37,313       | 0.500<br>12,700 | 0.375<br>9,525        | 0.422<br>10,719       | 0.437<br>11,100                     | 0.188<br>4,775                      | –                                       | –                                       |
| <b>05</b>         | 0.07<br>1,778        | 1.625<br>41,275       | 0.580<br>14,732 | 0.437<br>11,100       | 0.485<br>12,319       | 0.500<br>12,700                     | 0.250<br>6,350                      | –                                       | –                                       |
| <b>06</b>         | 0.07<br>1,778        | 1.812<br>46,025       | 0.660<br>16,764 | 0.437<br>11,100       | 0.547<br>13,894       | 0.562<br>14,275                     | 0.250<br>6,350                      | –                                       | –                                       |
| <b>07</b>         | 0.07<br>1,778        | 2.000<br>50,800       | 0.720<br>18,288 | 0.500<br>12,687       | 0.610<br>15,494       | 0.625<br>15,875                     | 0.250<br>6,350                      | –                                       | –                                       |

<sup>1)</sup> Parts are delivered and marked with UFJ/XRL.. and 12BF.. standard references

<sup>2)</sup> K version

### Cross-reference designation system to UFJ/XRL.. or 12BF..

|                                                    |                               |   |   |        |    |   |   |
|----------------------------------------------------|-------------------------------|---|---|--------|----|---|---|
| Examples:                                          | SEFJ/WAS04GK<br>FJ/WAS14      | S | E | FJ/WAS | 04 | G | K |
| <b>Rod end body material and surface treatment</b> |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Cadmium plated 4340 steel     |   |   |        |    |   |   |
| <b>S<sup>3)</sup></b>                              | Zinc-nickel plated 4340 steel |   |   |        |    |   |   |
| <b>Inner ring material</b>                         |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | 440C (WAS..R bearing)         |   |   |        |    |   |   |
| <b>E</b>                                           | PH13.8 (EWAS..R.. bearing)    |   |   |        |    |   |   |
| <b>Basic designation</b>                           |                               |   |   |        |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch)          |                               |   |   |        |    |   |   |
| <b>Thread direction</b>                            |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Right-hand thread             |   |   |        |    |   |   |
| <b>G</b>                                           | Left-hand thread              |   |   |        |    |   |   |
| <b>Keyway</b>                                      |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Without keyway                |   |   |        |    |   |   |
| <b>K</b>                                           | With keyway type K            |   |   |        |    |   |   |
| <b>W</b>                                           | With deep keyway type W       |   |   |        |    |   |   |

<sup>3)</sup> SKF option

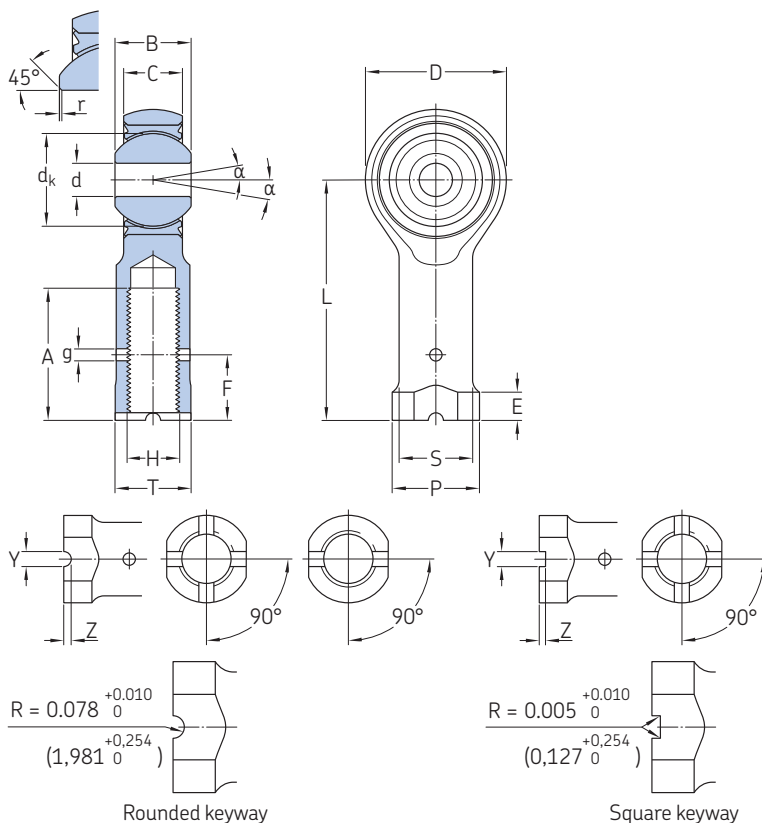
### Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>Z <sup>4)</sup><br>+0,005/0<br>+0,127/0 | Y <sup>4)</sup><br>+0,005/0<br>+0,127/0 | $\alpha$ | Mass<br>$\approx$ | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque      |
|-------------------|-------------------------------------------------------|-----------------------------------------|----------|-------------------|--------------------------|--------------------------|----------------------|
| –                 | in/mm                                                 |                                         | °        | lb/g              | lbf/kN                   |                          | lbf-in/Nm            |
| <b>03</b>         | 0.110<br>2,794                                        | 0.062<br>1,575                          | 15       | 0.080<br>36       | 2 360<br>10,50           | 1 470<br>6,54            | 0.5/6<br>0,056/0,678 |
| <b>04</b>         | 0.110<br>2,794                                        | 0.062<br>1,575                          | 15       | 0.084<br>38       | 4 860<br>21,62           | 2 380<br>10,59           | 0.5/6<br>0,056/0,678 |
| <b>05</b>         | 0.110<br>2,794                                        | 0.093<br>2,362                          | 14       | 0.102<br>46       | 7 180<br>31,95           | 3 020<br>13,43           | 1/15<br>0,113/1,695  |
| <b>06</b>         | 0.110<br>2,794                                        | 0.093<br>2,362                          | 8        | 0.161<br>73       | 8 550<br>38,05           | 3 570<br>15,88           | 1/15<br>0,113/1,695  |
| <b>07</b>         | 0.110<br>2,794                                        | 0.093<br>2,362                          | 10       | 0.212<br>96       | 12 000<br>53,40          | 4 800<br>21,35           | 1/15<br>0,113/1,695  |

<sup>4)</sup> W version

### 3.29 Internal inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

FJ/WAS.. (UFJ/XRL.. or 12BF..) <sup>1)</sup> bore code **08** to **16**



|                         |                                                                   |
|-------------------------|-------------------------------------------------------------------|
| Technical specification | AS 81935                                                          |
| Product standard        | AS 81935/2                                                        |
| Bearing                 | WAS..R inch (440C inner ring)<br>EWAS..R inch (PH13.8 inner ring) |

| Keyway type | Bore code | Keyway shape | Number of slots |
|-------------|-----------|--------------|-----------------|
| K           | ≤ 06      | Rounded      | 2               |
|             | 07 to 08  | Rounded      | 4               |
|             | ≥ 10      | Square       | 4               |
| W           | All       | Square       | 4               |

#### Dimensions

| Nominal bore code | Dimensions<br>d        | D                | B                    | C                | A<br>Min        | d <sub>k</sub><br>≈ | r                | H<br>UNJF-3B         |
|-------------------|------------------------|------------------|----------------------|------------------|-----------------|---------------------|------------------|----------------------|
|                   | 0/-0.0005<br>0/-0,0127 | ±0.010<br>±0,254 | 0/-0.002<br>0/-0,051 | ±0.005<br>±0,127 |                 |                     | ±0.005<br>±0,127 |                      |
| –                 | in/mm                  |                  |                      |                  |                 |                     |                  | –                    |
| <b>08</b>         | 0.5000<br>12,700       | 1.337<br>33,960  | 0.625<br>15,875      | 0.515<br>13,081  | 1.250<br>31,750 | 0.871<br>22,130     | 0.010<br>0,254   | 1/2-20<br>12,7-20    |
| <b>10</b>         | 0.6250<br>15,875       | 1.525<br>38,735  | 0.750<br>19,050      | 0.577<br>14,656  | 1.375<br>34,925 | 1.059<br>26,887     | 0.254<br>0,010   | 5/8-18<br>15,87-18   |
| <b>12</b>         | 0.7500<br>19,050       | 1.775<br>45,085  | 0.875<br>22,225      | 0.640<br>16,256  | 1.625<br>41,275 | 1.216<br>30,897     | 0.010<br>0,254   | 3/4-16<br>19,05-16   |
| <b>14</b>         | 0.8750<br>22,225       | 2.025<br>51,435  | 0.875<br>22,225      | 0.765<br>19,431  | 1.875<br>47,625 | 1.325<br>33,655     | 0.010<br>0,254   | 7/8-14<br>22,22-14   |
| <b>16</b>         | 1.0000<br>25,400       | 2.775<br>70,485  | 1.375<br>34,925      | 1.015<br>25,781  | 2.125<br>53,975 | 1.871<br>47,526     | 0.010<br>0,254   | 1 1/4-12<br>31,75-12 |

#### Dimensions cont.

| Nominal bore code | Dimensions<br>g | L                | P               | F                | S                | T                              | E                              | Z <sup>2)</sup>      | Y <sup>2)</sup>      |
|-------------------|-----------------|------------------|-----------------|------------------|------------------|--------------------------------|--------------------------------|----------------------|----------------------|
|                   | ≈               | ±0.010<br>±0,254 | ≈               | ±0.020<br>±0,508 | ±0.010<br>±0,254 | +0.002/-0.010<br>+0,051/-0,254 | +0.010/-0.062<br>+0,254/-1,575 | +0.005/0<br>+0,127/0 | +0.005/0<br>+0,127/0 |
| –                 | in/mm           |                  |                 |                  |                  |                                |                                |                      |                      |
| <b>08</b>         | 0.07<br>1,778   | 2.250<br>57,150  | 0.880<br>22,352 | 0.562<br>14,275  | 0.735<br>18,669  | 0.750<br>19,050                | 0.250<br>6,350                 | –<br>–               | –<br>–               |
| <b>10</b>         | 0.07<br>1,778   | 2.500<br>63,500  | 1.020<br>25,908 | 0.687<br>17,450  | 0.860<br>21,844  | 0.875<br>22,225                | 0.375<br>9,525                 | 0.077<br>1,956       | 0.125<br>3,175       |
| <b>12</b>         | 0.07<br>1,778   | 2.875<br>73,025  | 1.160<br>29,464 | 0.812<br>20,625  | 0.985<br>25,019  | 1.000<br>25,400                | 0.375<br>9,525                 | 0.077<br>1,956       | 0.125<br>3,175       |
| <b>14</b>         | 0.07<br>1,778   | 3.375<br>85,725  | 1.300<br>33,020 | 0.937<br>23,800  | 1.110<br>28,194  | 1.125<br>28,575                | 0.500<br>12,700                | 0.086<br>2,184       | 0.156<br>3,962       |
| <b>16</b>         | 0.07<br>1,778   | 4.125<br>104,775 | 2.020<br>51,308 | 1.312<br>33,325  | 1.688<br>42,875  | 1.750<br>44,450                | 0.563<br>14,300                | 0.116<br>2,946       | 0.187<br>4,750       |

<sup>1)</sup> Parts are delivered and marked with UFJ/XRL.. and 12BF.. standard references

<sup>2)</sup> K version

### Cross-reference designation system to UFJ/XRL.. or 12BF..

|                                                    |                               |   |   |        |    |   |   |
|----------------------------------------------------|-------------------------------|---|---|--------|----|---|---|
| Examples:                                          | SEFJ/WAS04GK<br>FJ/WAS14      | S | E | FJ/WAS | 04 | G | K |
| <b>Rod end body material and surface treatment</b> |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Cadmium plated 4340 steel     |   |   |        |    |   |   |
| <b>S<sup>3)</sup></b>                              | Zinc-nickel plated 4340 steel |   |   |        |    |   |   |
| <b>Inner ring material</b>                         |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | 440C (WAS..R bearing)         |   |   |        |    |   |   |
| <b>E</b>                                           | PH13.8 (EWAS..R.. bearing)    |   |   |        |    |   |   |
| <b>Basic designation</b>                           |                               |   |   |        |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch)          |                               |   |   |        |    |   |   |
| <b>Thread direction</b>                            |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Right-hand thread             |   |   |        |    |   |   |
| <b>G</b>                                           | Left-hand thread              |   |   |        |    |   |   |
| <b>Keyway</b>                                      |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Without keyway                |   |   |        |    |   |   |
| <b>K</b>                                           | With keyway type K            |   |   |        |    |   |   |
| <b>W</b>                                           | With deep keyway type W       |   |   |        |    |   |   |

<sup>3)</sup> SKF option

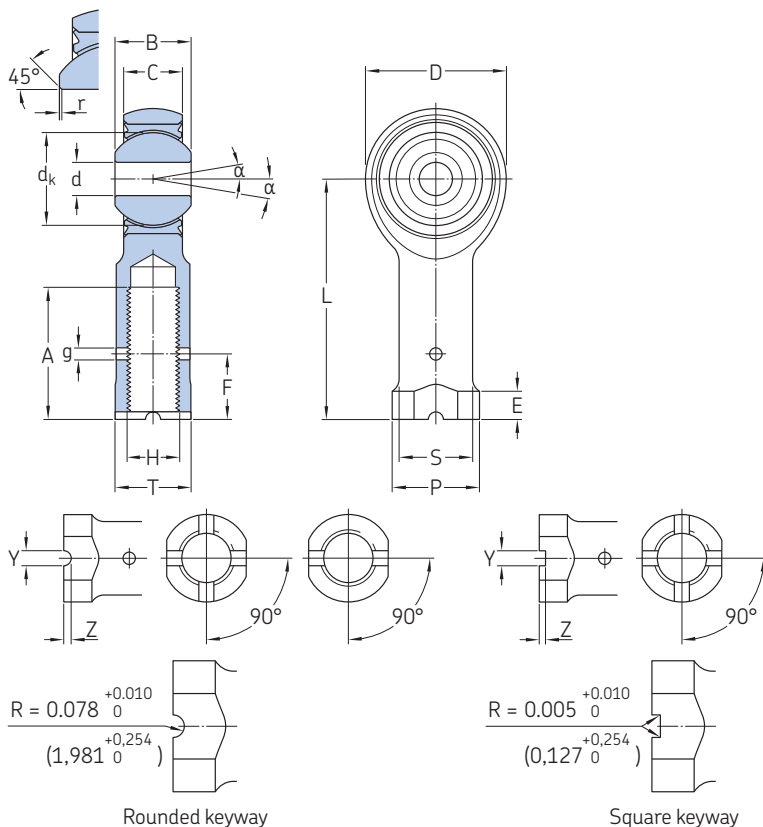
### Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>Z <sup>4)</sup><br>+0.005/0<br>+0.127/0 | Y <sup>4)</sup><br>+0.005/0<br>+0.127/0 | $\alpha$ | Mass<br>$\approx$ | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque     |
|-------------------|-------------------------------------------------------|-----------------------------------------|----------|-------------------|--------------------------|--------------------------|---------------------|
| –                 | in/mm                                                 |                                         | °        | lb/g              | lbf/kN                   |                          | lbf-in/Nm           |
| <b>08</b>         | 0.110<br>2,794                                        | 0.093<br>2,362                          | 9        | 0.325<br>147      | 19 500<br>86,70          | 8 260<br>36,74           | 1/15<br>0.113/1.695 |
| <b>10</b>         | 0.110<br>2,794                                        | 0.125<br>3,175                          | 12       | 0.481<br>218      | 21 900<br>97,45          | 9 180<br>40,83           | 1/15<br>0.113/1.695 |
| <b>12</b>         | 0.110<br>2,794                                        | 0.125<br>3,175                          | 13       | 0.673<br>305      | 29 300<br>130,38         | 11 600<br>51,60          | 1/15<br>0.113/1.695 |
| <b>14</b>         | 0.110<br>2,794                                        | 0.156<br>3,962                          | 6        | 0.959<br>435      | 34 500<br>153,52         | 13 100<br>58,27          | 1/24<br>0.113/2.712 |
| <b>16</b>         | 0.116<br>2,946                                        | 0.187<br>4,750                          | 12       | 2.717<br>1 232    | 80 300<br>357,31         | 30 400<br>135,22         | 1/24<br>0.113/2.712 |

<sup>4)</sup> W version

### 3.30 Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

PHUFJ/WAS.. (PHUFJ/XRL.. or 12CF..) <sup>1)</sup> bore code **03** to **07**



|                                |                                                                   |
|--------------------------------|-------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81935                                                          |
| <b>Product standard</b>        | AS 81935/7                                                        |
| <b>Rod end body</b>            | PH13.8 passivated                                                 |
| <b>Bearing</b>                 | WAS..R inch (440C inner ring)<br>EWAS..R inch (PH13.8 inner ring) |

| Keyway type | Bore code | Keyway shape | Number of slots |
|-------------|-----------|--------------|-----------------|
| K           | ≤ 06      | Rounded      | 2               |
|             | 07 to 08  | Rounded      | 4               |
|             | ≥ 10      | Square       | 4               |
| W           | All       | Square       | 4               |

#### Dimensions

| Nominal bore code | Dimensions<br>d<br>0/-0.0005<br>0/-0.0127 | D<br>±0.010<br>±0.254 | B<br>0/-0.002<br>0/-0.051 | C<br>±0.005<br>±0.127 | A<br>Min        | d <sub>k</sub><br>≈ | r<br>±0.005<br>±0.127 | H<br>UNJF-3B        |
|-------------------|-------------------------------------------|-----------------------|---------------------------|-----------------------|-----------------|---------------------|-----------------------|---------------------|
| –                 | in/mm                                     |                       |                           |                       |                 |                     |                       | –                   |
| <b>03</b>         | 0.1900<br>4,826                           | 0.806<br>20,472       | 0.437<br>11,100           | 0.337<br>8,56         | 0.750<br>19,050 | 0.530<br>13,464     | 0.010<br>0,254        | 5/16-24<br>7,94-24  |
| <b>04</b>         | 0.2500<br>6,350                           | 0.806<br>20,472       | 0.437<br>11,100           | 0.337<br>8,56         | 0.750<br>19,050 | 0.530<br>13,464     | 0.010<br>0,254        | 5/16-24<br>7,94-24  |
| <b>05</b>         | 0.3125<br>7,938                           | 0.900<br>22,860       | 0.437<br>11,100           | 0.327<br>8,306        | 0.875<br>22,225 | 0.566<br>14,381     | 0.010<br>0,254        | 3/8-24<br>9,52-24   |
| <b>06</b>         | 0.3750<br>9,525                           | 1.025<br>26,035       | 0.500<br>12,700           | 0.416<br>10,566       | 1.000<br>25,400 | 0.683<br>17,361     | 0.010<br>0,254        | 3/8-24<br>9,52-24   |
| <b>07</b>         | 0.4375<br>11,113                          | 1.150<br>29,210       | 0.562<br>14,275           | 0.452<br>11,481       | 1.125<br>28,575 | 0.777<br>19,744     | 0.010<br>0,254        | 7/16-20<br>11,11-20 |

#### Dimensions cont.

| Nominal bore code | Dimensions<br>g<br>≈ | L<br>±0.010<br>±0.254 | P<br>≈          | F<br>±0.020<br>±0.508 | S<br>±0.010<br>±0.254 | T<br>+0.002/-0.010<br>+0.051/-0.254 | E<br>+0.010/-0.062<br>+0.254/-1,575 | Z <sup>2)</sup><br>+0.005/0<br>+0.127/0 | Y <sup>2)</sup><br>+0.005/0<br>+0.127/0 |
|-------------------|----------------------|-----------------------|-----------------|-----------------------|-----------------------|-------------------------------------|-------------------------------------|-----------------------------------------|-----------------------------------------|
| –                 | in/mm                |                       |                 |                       |                       |                                     |                                     |                                         |                                         |
| <b>03</b>         | 0.07<br>1,778        | 1.375<br>34,925       | 0.500<br>12,700 | 0.375<br>9,525        | 0.422<br>10,719       | 0.437<br>11,100                     | 0.188<br>4,775                      | –                                       | –                                       |
| <b>04</b>         | 0.07<br>1,778        | 1.469<br>37,313       | 0.500<br>12,700 | 0.375<br>9,525        | 0.422<br>10,719       | 0.437<br>11,100                     | 0.188<br>4,775                      | –                                       | –                                       |
| <b>05</b>         | 0.07<br>1,778        | 1.625<br>41,275       | 0.580<br>14,732 | 0.437<br>11,100       | 0.485<br>12,319       | 0.500<br>12,700                     | 0.250<br>6,350                      | –                                       | –                                       |
| <b>06</b>         | 0.07<br>1,778        | 1.812<br>46,025       | 0.660<br>16,764 | 0.437<br>11,100       | 0.547<br>13,894       | 0.562<br>14,275                     | 0.250<br>6,350                      | –                                       | –                                       |
| <b>07</b>         | 0.07<br>1,778        | 2.000<br>50,800       | 0.720<br>18,288 | 0.500<br>12,687       | 0.610<br>15,494       | 0.625<br>15,875                     | 0.250<br>6,350                      | –                                       | –                                       |

<sup>1)</sup> Parts are delivered and marked with PHUFJ/XRL.. or 12CF.. standard references

<sup>2)</sup> K version



### Cross-reference designation system to PHUFJ/XRL.. or 12CF..



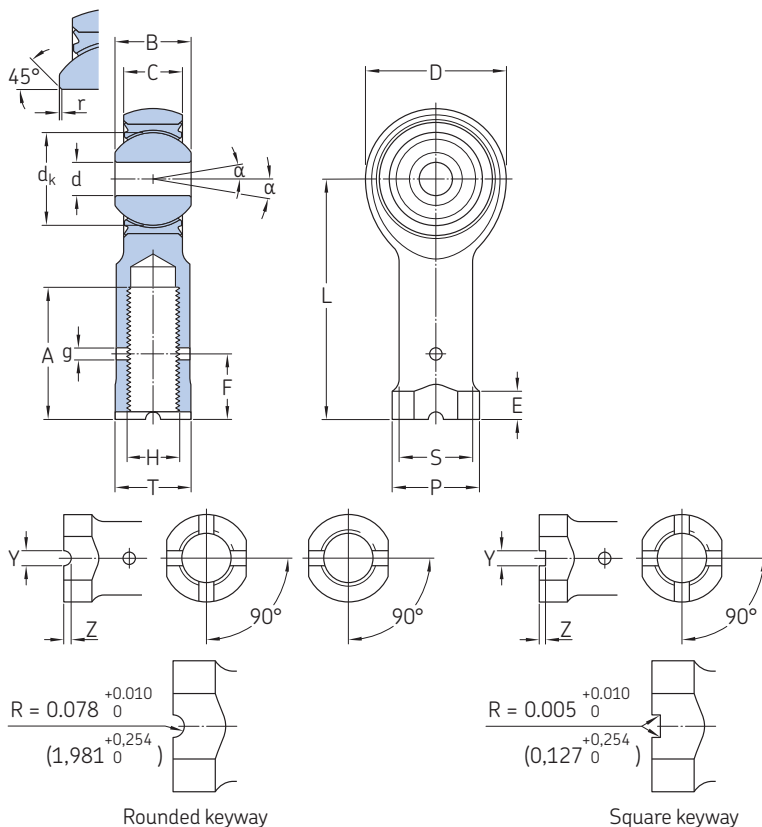
### Dimensions cont., loads and torque

| Nominal bore code | Dimensions                              |                                         | $\alpha$ | Mass<br>$\approx$ | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque      |
|-------------------|-----------------------------------------|-----------------------------------------|----------|-------------------|--------------------------|--------------------------|----------------------|
|                   | Z <sup>2)</sup><br>+0,005/0<br>+0,127/0 | Y <sup>2)</sup><br>+0,005/0<br>+0,127/0 |          |                   |                          |                          |                      |
| —                 | in/mm                                   |                                         | °        | lb/g              | lbf/kN                   |                          | lbf-in/Nm            |
| <b>03</b>         | 0.110<br>2,794                          | 0.062<br>1,575                          | 15       | 0.080<br>36       | 2 360<br>10,50           | 1 470<br>6,54            | 0.5/6<br>0,056/0,678 |
| <b>04</b>         | 0.110<br>2,794                          | 0.062<br>1,575                          | 15       | 0.084<br>38       | 4 860<br>21,62           | 2 380<br>10,59           | 0.5/6<br>0,056/0,678 |
| <b>05</b>         | 0.110<br>2,794                          | 0.093<br>2,362                          | 14       | 0.102<br>46       | 7 180<br>31,95           | 3 020<br>13,43           | 1/15<br>0,113/1,695  |
| <b>06</b>         | 0.110<br>2,794                          | 0.093<br>2,362                          | 8        | 0.161<br>73       | 8 550<br>38,05           | 3 570<br>15,88           | 1/15<br>0,113/1,695  |
| <b>07</b>         | 0.110<br>2,794                          | 0.093<br>2,362                          | 10       | 0.212<br>96       | 12 000<br>53,40          | 4 800<br>21,35           | 1/15<br>0,113/1,695  |

<sup>2)</sup> W version

### 3.30 Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

PHUFJ/WAS.. (PHUFJ/XRL.. or 12CF..) <sup>1)</sup> bore code **08** to **16**



|                                |                                                                   |
|--------------------------------|-------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81935                                                          |
| <b>Product standard</b>        | AS 81935/7                                                        |
| <b>Rod end body</b>            | PH13.8 passivated                                                 |
| <b>Bearing</b>                 | WAS..R inch (440C inner ring)<br>EWAS..R inch (PH13.8 inner ring) |

| Keyway type | Bore code | Keyway shape | Number of slots |
|-------------|-----------|--------------|-----------------|
| K           | ≤ 06      | Rounded      | 2               |
|             | 07 to 08  | Rounded      | 4               |
|             | ≥ 10      | Square       | 4               |
| W           | All       | Square       | 4               |

#### Dimensions

| Nominal bore code | Dimensions<br>d<br>0/-0.0005<br>0/-0.0127 | D<br>±0.010<br>±0.254 | B<br>0/-0.002<br>0/-0.051 | C<br>±0.005<br>±0.127 | A<br>Min        | d <sub>k</sub><br>≈ | r<br>±0.005<br>±0.127 | H<br>UNJF-3B         |
|-------------------|-------------------------------------------|-----------------------|---------------------------|-----------------------|-----------------|---------------------|-----------------------|----------------------|
| –                 | in/mm                                     |                       |                           |                       |                 |                     |                       | –                    |
| <b>08</b>         | 0.5000<br>12,700                          | 1.337<br>33,960       | 0.625<br>15,875           | 0.515<br>13,081       | 1.250<br>31,750 | 0.871<br>22,130     | 0.010<br>0,254        | 1/2-20<br>12,7-20    |
| <b>10</b>         | 0.6250<br>15,875                          | 1.525<br>38,735       | 0.750<br>19,050           | 0.577<br>14,656       | 1.375<br>34,925 | 1.059<br>26,887     | 0.254<br>0,010        | 5/8-18<br>15,87-18   |
| <b>12</b>         | 0.7500<br>19,050                          | 1.775<br>45,085       | 0.875<br>22,225           | 0.640<br>16,256       | 1.625<br>41,275 | 1.216<br>30,897     | 0.010<br>0,254        | 3/4-16<br>19,05-16   |
| <b>14</b>         | 0.8750<br>22,225                          | 2.025<br>51,435       | 0.875<br>22,225           | 0.765<br>19,431       | 1.875<br>47,625 | 1.325<br>33,655     | 0.010<br>0,254        | 7/8-14<br>22,22-14   |
| <b>16</b>         | 1.0000<br>25,400                          | 2.775<br>70,485       | 1.375<br>34,925           | 1.015<br>25,781       | 2.125<br>53,975 | 1.871<br>47,526     | 0.010<br>0,254        | 1 1/4-12<br>31,75-12 |

#### Dimensions cont.

| Nominal bore code | Dimensions<br>g<br>≈ | L<br>±0.010<br>±0.254 | P<br>≈          | F<br>±0.020<br>±0.508 | S<br>±0.010<br>±0.254 | T<br>+0.002/-0.010<br>+0.051/-0.254 | E<br>+0.010/-0.062<br>+0.254/-1.575 | Z <sup>2)</sup><br>+0.005/0<br>+0.127/0 | Y <sup>1)</sup><br>+0.005/0<br>+0.127/0 |
|-------------------|----------------------|-----------------------|-----------------|-----------------------|-----------------------|-------------------------------------|-------------------------------------|-----------------------------------------|-----------------------------------------|
| –                 | in/mm                |                       |                 |                       |                       |                                     |                                     |                                         |                                         |
| <b>08</b>         | 0.07<br>1,778        | 2.250<br>57,150       | 0.880<br>22,352 | 0.562<br>14,275       | 0.735<br>18,669       | 0.750<br>19,050                     | 0.250<br>6,350                      | –<br>–                                  | –<br>–                                  |
| <b>10</b>         | 0.07<br>1,778        | 2.500<br>63,500       | 1.020<br>25,908 | 0.687<br>17,450       | 0.860<br>21,844       | 0.875<br>22,225                     | 0.375<br>9,525                      | 0.077<br>1,956                          | 0.125<br>3,175                          |
| <b>12</b>         | 0.07<br>1,778        | 2.875<br>73,025       | 1.160<br>29,464 | 0.812<br>20,625       | 0.985<br>25,019       | 1.000<br>25,400                     | 0.375<br>9,525                      | 0.077<br>1,956                          | 0.125<br>3,175                          |
| <b>14</b>         | 0.07<br>1,778        | 3.375<br>85,725       | 1.300<br>33,020 | 0.937<br>23,800       | 1.110<br>28,194       | 1.125<br>28,575                     | 0.500<br>12,700                     | 0.086<br>2,184                          | 0.156<br>3,962                          |
| <b>16</b>         | 0.07<br>1,778        | 4.125<br>104,775      | 2.020<br>51,308 | 1.312<br>33,325       | 1.688<br>42,875       | 1.750<br>44,450                     | 0.563<br>14,300                     | 0.116<br>2,946                          | 0.187<br>4,750                          |

<sup>1)</sup> Parts are delivered and marked with PHUFJ/XRL.. or 12CF.. standard references

<sup>2)</sup> K version

# Cross-reference designation system to PHUFJ/XRL.. or 12CF..

|                                    |                             |   |          |    |   |   |
|------------------------------------|-----------------------------|---|----------|----|---|---|
| Examples:                          | EPHFJ/WAS04GK<br>PHFJ/WAS14 | E | PHFJ/WAS | 04 | G | K |
| Inner ring material                |                             |   |          |    |   |   |
| No code                            | 440C (WAS..R bearing)       |   |          |    |   |   |
| E                                  | PH13.8 (EWAS..R.. bearing)  |   |          |    |   |   |
| Basic designation                  |                             |   |          |    |   |   |
| Bore code (multiples of 1/16 inch) |                             |   |          |    |   |   |
| Thread direction                   |                             |   |          |    |   |   |
| No code                            | Right-hand thread           |   |          |    |   |   |
| G                                  | Left-hand thread            |   |          |    |   |   |
| Keyway                             |                             |   |          |    |   |   |
| No code                            | Without keyway              |   |          |    |   |   |
| K                                  | With keyway type K          |   |          |    |   |   |
| W                                  | With deep keyway type W     |   |          |    |   |   |

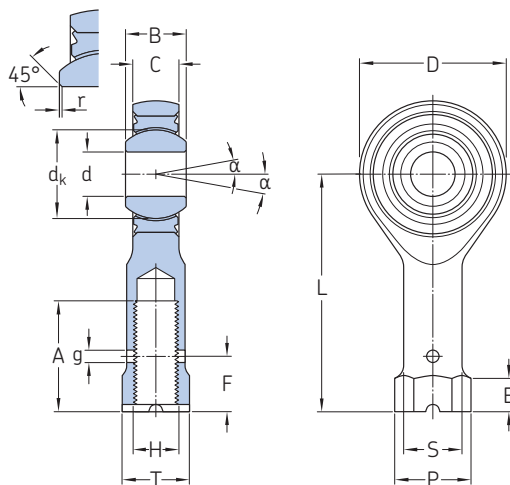
## Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>Z <sup>2)</sup><br>+0,005/0<br>+0,127/0 | Y <sup>2)</sup><br>+0,005/0<br>+0,127/0 | $\alpha$ | Mass<br>$\approx$ | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque     |
|-------------------|-------------------------------------------------------|-----------------------------------------|----------|-------------------|--------------------------|--------------------------|---------------------|
| –                 | in/mm                                                 |                                         | °        | lb/g              | lbf/kN                   |                          | lbf-in/Nm           |
| 08                | 0.110<br>2,794                                        | 0.093<br>2,362                          | 9        | 0.325<br>147      | 19 500<br>86,70          | 8 260<br>36,74           | 1/15<br>0,113/1,695 |
| 10                | 0.110<br>2,794                                        | 0.125<br>3,175                          | 12       | 0.481<br>218      | 21 900<br>97,45          | 9 180<br>40,83           | 1/15<br>0,113/1,695 |
| 12                | 0.110<br>2,794                                        | 0.125<br>3,175                          | 13       | 0.673<br>305      | 29 300<br>130,38         | 11 600<br>51,60          | 1/15<br>0,113/1,695 |
| 14                | 0.110<br>2,794                                        | 0.156<br>3,962                          | 6        | 0.959<br>435      | 34 500<br>153,52         | 13 100<br>58,27          | 1/24<br>0,113/2,712 |
| 16                | 0.116<br>2,946                                        | 0.187<br>4,750                          | 12       | 2.717<br>1 232    | 80 300<br>357,31         | 30 400<br>135,22         | 1/24<br>0,113/2,712 |

<sup>2)</sup> W version

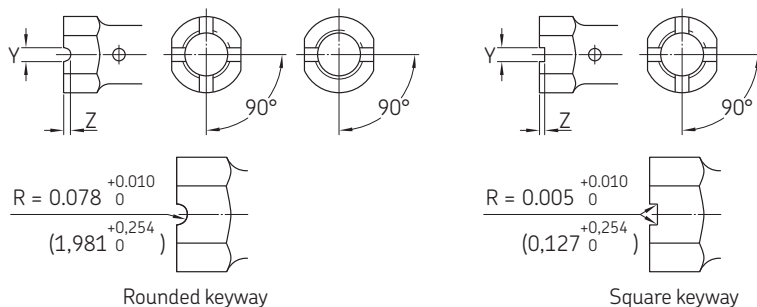
### 3.31 Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

FJ/NAS.. (UFJ/XRE.. or 12BNF..) <sup>1)</sup> bore code **03** to **07**



|                         |                                                                   |
|-------------------------|-------------------------------------------------------------------|
| Technical specification | AS 81935                                                          |
| Product standard        | AS 81935/5                                                        |
| Bearing                 | NAS..R inch (440C inner ring)<br>ENAS..R inch (PH13.8 inner ring) |

| Keyway type | Bore code | Keyway shape | Number of slots |
|-------------|-----------|--------------|-----------------|
| K           | ≤ 06      | Rounded      | 2               |
|             | 07 to 08  | Rounded      | 4               |
|             | ≥ 10      | Square       | 4               |
| W           | All       | Square       | 4               |



#### Dimensions

| Nominal<br>bore<br>code | Dimensions             |                  |                      |                  |        |                |                  |       |
|-------------------------|------------------------|------------------|----------------------|------------------|--------|----------------|------------------|-------|
|                         | d                      | D                | B                    | C                | A      | d <sub>k</sub> | r                | g     |
|                         | 0/-0.0005<br>0/-0,0127 | ±0.010<br>±0,254 | 0/-0.002<br>0/-0,051 | ±0.005<br>±0,127 | Min    | ≈              | ±0.005<br>±0,127 | ≈     |
| –                       | in/mm                  |                  |                      |                  |        |                |                  |       |
| 03                      | 0.1900                 | 0.680            | 0.281                | 0.228            | 0.625  | 0.406          | 0.010            | 0.07  |
|                         | 4,826                  | 17,272           | 7,137                | 5,791            | 15,875 | 10,312         | 0,254            | 1,778 |
| 04                      | 0.2500                 | 0.827            | 0.343                | 0.260            | 0.625  | 0.500          | 0.010            | 0.07  |
|                         | 6,350                  | 21,006           | 8,712                | 6,604            | 15,875 | 12,704         | 0,254            | 1,778 |
| 05                      | 0.3125                 | 0.984            | 0.375                | 0.291            | 0.750  | 0.562          | 0.010            | 0.07  |
|                         | 7,938                  | 24,994           | 9,525                | 7,391            | 19,050 | 14,283         | 0,254            | 1,778 |
| 06                      | 0.3750                 | 1.131            | 0.406                | 0.322            | 1.000  | 0.625          | 0.010            | 0.07  |
|                         | 9,525                  | 28,727           | 10,312               | 8,179            | 25,400 | 15,872         | 0,254            | 1,778 |
| 07                      | 0.4375                 | 1.294            | 0.437                | 0.353            | 1.125  | 0.687          | 0.010            | 0.07  |
|                         | 11,113                 | 32,868           | 11,100               | 8,966            | 28,575 | 17,448         | 0,254            | 1,778 |

#### Dimensions cont.

| Nominal bore code | Dimensions          | H               | L                | P               | F                | S                | T                              | E                              | Z <sup>2)</sup>      | Y <sup>2)</sup>      |
|-------------------|---------------------|-----------------|------------------|-----------------|------------------|------------------|--------------------------------|--------------------------------|----------------------|----------------------|
|                   |                     | UNJF-3B         | ±0.010<br>±0.254 | ≈               | ±0.020<br>±0.508 | ±0.010<br>±0.254 | +0.002/-0.010<br>+0.051/-0.254 | +0.010/-0.062<br>+0.254/-1.575 | +0.005/0<br>+0.127/0 | +0.005/0<br>+0.127/0 |
| –                 | –                   | in/mm           |                  |                 |                  |                  |                                |                                |                      |                      |
| <b>03</b>         | 1/4-28<br>6,35-28   | 1.210<br>30,734 | 0.430<br>10,922  | 0.312<br>7,925  | 0.329<br>8,357   | 0.375<br>9,525   | 0.188<br>4,775                 | -                              | -                    | -                    |
| <b>04</b>         | 1/4-28<br>6,35-28   | 1.338<br>33,985 | 0.430<br>10,922  | 0.312<br>7,925  | 0.329<br>8,357   | 0.375<br>9,525   | 0.188<br>4,775                 | -                              | -                    | -                    |
| <b>05</b>         | 5/16-24<br>7,94-24  | 1.566<br>39,774 | 0.500<br>12,700  | 0.375<br>9,525  | 0.413<br>10,490  | 0.437<br>11,100  | 0.188<br>4,775                 | -                              | -                    | -                    |
| <b>06</b>         | 3/8-24<br>9,52-24   | 1.908<br>48,463 | 0.720<br>18,288  | 0.437<br>11,100 | 0.501<br>12,725  | 0.625<br>15,875  | 0.250<br>6,350                 | -                              | -                    | -                    |
| <b>07</b>         | 7/16-20<br>11,11-20 | 2.125<br>53,975 | 0.720<br>18,288  | 0.500<br>12,700 | 0.584<br>14,834  | 0.625<br>15,875  | 0.250<br>6,350                 | -                              | -                    | -                    |

<sup>1)</sup> Parts are delivered and marked with UFJ/XRE.. and 12BNF.. standard references

<sup>2)</sup> K version



### Cross-reference designation system to UFJ/XRE.. or 12BNF..

|                                                    |                               |   |   |        |    |   |   |
|----------------------------------------------------|-------------------------------|---|---|--------|----|---|---|
| Examples:                                          | SEFJ/NAS04GK<br>FJ/NAS14      | S | E | FJ/NAS | 04 | G | K |
| <b>Rod end body material and surface treatment</b> |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Cadmium plated 4340 steel     |   |   |        |    |   |   |
| <b>S<sup>3)</sup></b>                              | Zinc-nickel plated 4340 steel |   |   |        |    |   |   |
| <b>Inner ring material</b>                         |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | 440C (NAS..R bearing)         |   |   |        |    |   |   |
| <b>E</b>                                           | PH13.8 (ENAS..R.. bearing)    |   |   |        |    |   |   |
| <b>Basic designation</b>                           |                               |   |   |        |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch)          |                               |   |   |        |    |   |   |
| <b>Thread direction</b>                            |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Right-hand thread             |   |   |        |    |   |   |
| <b>G</b>                                           | Left-hand thread              |   |   |        |    |   |   |
| <b>Keyway</b>                                      |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Without keyway                |   |   |        |    |   |   |
| <b>K</b>                                           | With keyway type K            |   |   |        |    |   |   |
| <b>W</b>                                           | With deep keyway type W       |   |   |        |    |   |   |

<sup>3)</sup> SKF option

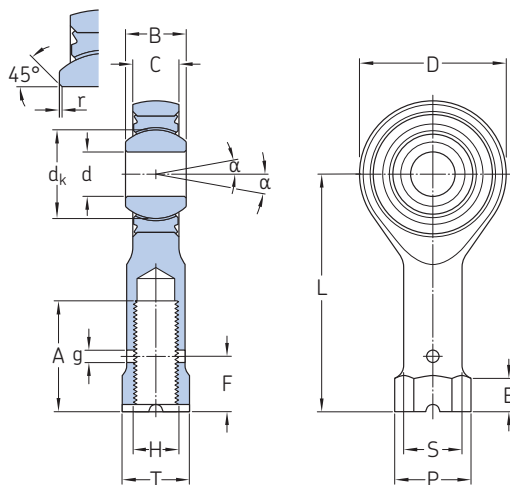
### Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>Z <sup>4)</sup><br>+0.005/0<br>+0.127/0 | Y <sup>4)</sup><br>+0.005/0<br>+0.127/0 | $\alpha$ | Mass<br>$\approx$ | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque      |
|-------------------|-------------------------------------------------------|-----------------------------------------|----------|-------------------|--------------------------|--------------------------|----------------------|
| –                 | in/mm                                                 |                                         | °        | lb/g              | lbf/kN                   |                          | lbf-in/Nm            |
| <b>03</b>         | 0.110<br>2,794                                        | 0.062<br>1,575                          | 10       | 0.044<br>20       | 3 000<br>13,34           | 1 100<br>4,89            | 0.5/6<br>0,056/0,678 |
| <b>04</b>         | 0.110<br>2,794                                        | 0.093<br>2,362                          | 10       | 0.052<br>24       | 5 500<br>24,46           | 1 300<br>5,78            | 0.5/6<br>0,056/0,678 |
| <b>05</b>         | 0.110<br>2,794                                        | 0.093<br>2,362                          | 10       | 0.087<br>40       | 8 900<br>39,59           | 2 000<br>8,90            | 1/15<br>0,113/1,695  |
| <b>06</b>         | 0.110<br>2,794                                        | 0.093<br>2,362                          | 9        | 0.137<br>62       | 13 400<br>59,60          | 3 100<br>13,79           | 1/15<br>0,113/1,695  |
| <b>07</b>         | 0.110<br>2,794                                        | 0.093<br>2,362                          | 8        | 0.193<br>88       | 18 200<br>80,95          | 4 200<br>18,68           | 1/15<br>0,113/1,695  |

<sup>4)</sup> W version

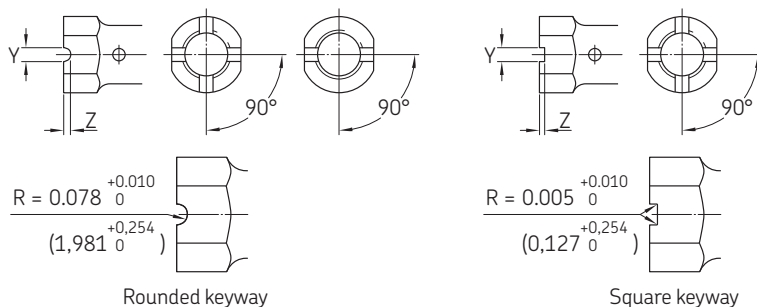
### 3.31 Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

FJ/NAS.. (UFJ/XRE.. or 12BNF..) <sup>1)</sup> bore 08 to 16



|                         |                                                                   |
|-------------------------|-------------------------------------------------------------------|
| Technical specification | AS 81935                                                          |
| Product standard        | AS 81935/5                                                        |
| Bearing                 | NAS..R inch (440C inner ring)<br>ENAS..R inch (PH13.8 inner ring) |

| Keyway type | Bore code | Keyway shape | Number of slots |
|-------------|-----------|--------------|-----------------|
| K           | ≤ 06      | Rounded      | 2               |
|             | 07 to 08  | Rounded      | 4               |
|             | ≥ 10      | Square       | 4               |
| W           | All       | Square       | 4               |



Rounded keyway

Square keyway

#### Dimensions

| Nominal<br>bore<br>code | Dimensions             |                  |                      |                  |        |                |                  |       |
|-------------------------|------------------------|------------------|----------------------|------------------|--------|----------------|------------------|-------|
|                         | d                      | D                | B                    | C                | A      | d <sub>k</sub> | r                | g     |
|                         | 0/−0.0005<br>0/−0,0127 | ±0.010<br>±0,254 | 0/−0.002<br>0/−0,051 | ±0.005<br>±0,127 | Min    | ≈              | ±0.005<br>±0,127 | ≈     |
| –                       | in/mm                  |                  |                      |                  |        |                |                  |       |
| 08                      | 0.5000                 | 1.459            | 0.500                | 0.400            | 1.250  | 0.781          | 0.010            | 0.07  |
|                         | 12,700                 | 37,059           | 12,700               | 10,160           | 31,750 | 19,838         | 0,254            | 1,778 |
| 10                      | 0.6250                 | 1.763            | 0.625                | 0.510            | 1.375  | 0.968          | 0.010            | 0.07  |
|                         | 15,875                 | 44,780           | 15,875               | 12,954           | 34,925 | 24,583         | 0,254            | 1,778 |
| 12                      | 0.7500                 | 2.140            | 0.750                | 0.603            | 1.625  | 1.187          | 0.010            | 0.07  |
|                         | 19,050                 | 54,356           | 19,050               | 15,316           | 41,275 | 30,149         | 0,254            | 1,778 |
| 14                      | 0.8750                 | 2.372            | 0.875                | 0.713            | 1.875  | 1.314          | 0.010            | 0.07  |
|                         | 22,225                 | 60,249           | 22,225               | 18,110           | 47,625 | 33,370         | 0,254            | 1,778 |
| 16                      | 1.0000                 | 2.681            | 1.000                | 0.807            | 2.125  | 1.500          | 0.010            | 0.07  |
|                         | 25,400                 | 68,097           | 25,400               | 20,498           | 53,975 | 38,099         | 0,254            | 1,778 |

#### Dimensions cont.

| Nominal bore code | Dimensions         | H                | L                | P               | F                | S                | T                              | E                              | Z <sup>2)</sup>      | Y <sup>2)</sup>      |
|-------------------|--------------------|------------------|------------------|-----------------|------------------|------------------|--------------------------------|--------------------------------|----------------------|----------------------|
|                   |                    | UNJF-3B          | ±0.010<br>±0.254 | ≈               | ±0.020<br>±0.508 | ±0.010<br>±0.254 | +0.002/-0.010<br>+0.051/-0.254 | +0.010/-0.062<br>+0.254/-1.575 | +0.005/0<br>+0.127/0 | +0.005/0<br>+0.127/0 |
| –                 | –                  | in/mm            |                  |                 |                  |                  |                                |                                |                      |                      |
| 08                | 1/2-20<br>12,7-20  | 2.356<br>59,842  | 1.020<br>25,908  | 0.562<br>14,275 | 0.672<br>17,069  | 0.875<br>22,225  | 0.375<br>9,525                 | -                              | -                    | -                    |
| 10                | 5/8-18<br>15,87-18 | 2.707<br>68,758  | 1.020<br>25,908  | 0.687<br>17,450 | 0.845<br>21,463  | 0.875<br>22,225  | 0.375<br>9,525                 | 0.077<br>1,956                 | 0.125<br>3,175       | 0.125<br>3,175       |
| 12                | 3/4-16<br>19,05-16 | 3.193<br>81,102  | 1.300<br>33,020  | 0.812<br>20,625 | 1.017<br>25,832  | 1.125<br>28,575  | 0.500<br>12,700                | 0.077<br>1,956                 | 0.125<br>3,175       | 0.125<br>3,175       |
| 14                | 7/8-14<br>22,22-14 | 3.677<br>93,396  | 1.375<br>34,925  | 0.937<br>23,800 | 1.187<br>30,150  | 1.250<br>31,750  | 0.500<br>12,700                | 0.086<br>2,184                 | 0.156<br>3,962       | 0.156<br>3,962       |
| 16                | 1-12<br>25,4-12    | 4.101<br>104,165 | 1.590<br>40,386  | 1.062<br>26,975 | 1.356<br>34,442  | 1.375<br>34,925  | 0.500<br>12,700                | 0.094<br>2,388                 | 0.156<br>3,962       | 0.156<br>3,962       |

<sup>1)</sup> Parts are delivered and marked with UFJ/XRE.. and 12BNF.. standard references

<sup>2)</sup> K version



### Cross-reference designation system to UFJ/XRE.. or 12BNF..

|                                                    |                               |   |   |        |    |   |   |
|----------------------------------------------------|-------------------------------|---|---|--------|----|---|---|
| Examples:                                          | SEFJ/NAS04GK<br>FJ/NAS14      | S | E | FJ/NAS | 04 | G | K |
| <b>Rod end body material and surface treatment</b> |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Cadmium plated 4340 steel     |   |   |        |    |   |   |
| <b>S<sup>3)</sup></b>                              | Zinc-nickel plated 4340 steel |   |   |        |    |   |   |
| <b>Inner ring material</b>                         |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | 440C (NAS..R bearing)         |   |   |        |    |   |   |
| <b>E</b>                                           | PH13.8 (ENAS..R.. bearing)    |   |   |        |    |   |   |
| <b>Basic designation</b>                           |                               |   |   |        |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch)          |                               |   |   |        |    |   |   |
| <b>Thread direction</b>                            |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Right-hand thread             |   |   |        |    |   |   |
| <b>G</b>                                           | Left-hand thread              |   |   |        |    |   |   |
| <b>Keyway</b>                                      |                               |   |   |        |    |   |   |
| <b>No code</b>                                     | Without keyway                |   |   |        |    |   |   |
| <b>K</b>                                           | With keyway type K            |   |   |        |    |   |   |
| <b>W</b>                                           | With deep keyway type W       |   |   |        |    |   |   |

<sup>3)</sup> SKF option

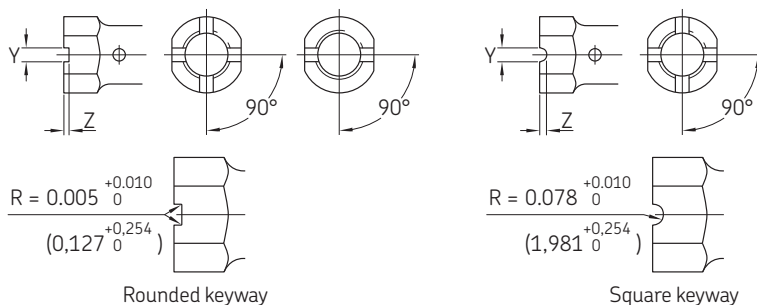
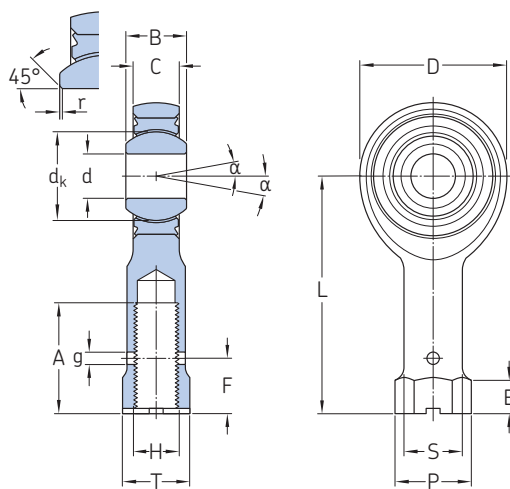
### Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>Z <sup>4)</sup><br>+0.005/0<br>+0,127/0 | Y <sup>4)</sup><br>+0.005/0<br>+0,127/0 | α | Mass<br>≈    | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque     |
|-------------------|-------------------------------------------------------|-----------------------------------------|---|--------------|--------------------------|--------------------------|---------------------|
| –                 | in/mm                                                 |                                         | ° | lb/g         | lbf/kN                   |                          | lbf-in/Nm           |
| 08                | 0.110<br>2,794                                        | 0.093<br>2,362                          | 8 | 0.279<br>127 | 24 600<br>109,42         | 5 700<br>25,35           | 1/15<br>0,113/1,695 |
| 10                | 0.110<br>2,794                                        | 0.125<br>3,175                          | 8 | 0.504<br>229 | 39 500<br>175,70         | 9 200<br>40,92           | 1/15<br>0,113/1,695 |
| 12                | 0.110<br>2,794                                        | 0.125<br>3,175                          | 8 | 0.860<br>390 | 57 200<br>254,43         | 13 500<br>60,05          | 1/15<br>0,113/1,695 |
| 14                | 0.110<br>2,794                                        | 0.125<br>3,175                          | 8 | 1.266<br>574 | 77 800<br>346,05         | 18 400<br>81,85          | 1/24<br>0,113/2,712 |
| 16                | 0.110<br>2,794                                        | 0.125<br>3,175                          | 9 | 1.814<br>823 | 101 000<br>449,25        | 24 000<br>106,75         | 1/24<br>0,113/2,712 |

<sup>4)</sup> W version

### 3.32 Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

PHFJ/NAS.. (PHUFJ/XRE.. or 12CNF..)² bore code **03** to **07**



|                                |                                                                   |
|--------------------------------|-------------------------------------------------------------------|
| <b>Technical specification</b> | AS 81935                                                          |
| <b>Product standard</b>        | AS 81935/9                                                        |
| <b>Rod end body</b>            | PH13.8 passivated                                                 |
| <b>Bearing</b>                 | NAS..R inch (440C inner ring)<br>ENAS..R inch (PH13.8 inner ring) |

| Keyway type | Bore code | Keyway shape | Number of slots |
|-------------|-----------|--------------|-----------------|
| K           | ≤ 06      | Rounded      | 2               |
|             | 07 to 08  | Rounded      | 4               |
| W           | ≥ 10      | Square       | 4               |
|             | All       | Square       | 4               |

#### Dimensions

| Nominal bore code | Dimensions<br>d<br>0/-0.0005<br>0/-0.0127 | D<br>±0.010<br>±0.254 | B<br>0/-0.002<br>0/-0.051 | C<br>±0.005<br>±0.127 | A<br>Min        | d <sub>k</sub><br>≈ | r<br>±0.005<br>±0.127 | g<br>≈        |
|-------------------|-------------------------------------------|-----------------------|---------------------------|-----------------------|-----------------|---------------------|-----------------------|---------------|
| –                 | in/mm                                     |                       |                           |                       |                 |                     |                       |               |
| <b>03</b>         | 0.1900<br>4,826                           | 0.680<br>17,272       | 0.281<br>7,137            | 0.228<br>5,791        | 0.625<br>15,875 | 0.406<br>10,312     | 0.010<br>0,254        | 0.07<br>1,778 |
| <b>04</b>         | 0.2500<br>6,350                           | 0.827<br>21,006       | 0.343<br>8,712            | 0.260<br>6,604        | 0.625<br>15,875 | 0.500<br>12,704     | 0.010<br>0,254        | 0.07<br>1,778 |
| <b>05</b>         | 0.3125<br>7,938                           | 0.984<br>24,994       | 0.375<br>9,525            | 0.291<br>7,391        | 0.750<br>19,050 | 0.562<br>14,283     | 0.010<br>0,254        | 0.07<br>1,778 |
| <b>06</b>         | 0.3750<br>9,525                           | 1.131<br>28,727       | 0.406<br>10,312           | 0.322<br>8,179        | 1.000<br>25,400 | 0.625<br>15,872     | 0.010<br>0,254        | 0.07<br>1,778 |
| <b>07</b>         | 0.4375<br>11,113                          | 1.294<br>32,868       | 0.437<br>11,100           | 0.353<br>8,966        | 1.125<br>28,575 | 0.687<br>17,448     | 0.010<br>0,254        | 0.07<br>1,778 |

#### Dimensions cont.

| Nominal bore code | Dimensions<br>H<br>UNJF-3B | L<br>±0.010<br>±0.254 | P<br>≈          | F<br>±0.020<br>±0.508 | S<br>±0.010<br>±0.254 | T<br>+0.002/-0.010<br>+0.051/-0.254 | E<br>+0.010/-0.062<br>+0.254/-1.575 | Z¹)<br>+0.005/0<br>+0.127/0 | Y¹)<br>+0.005/0<br>+0.127/0 |
|-------------------|----------------------------|-----------------------|-----------------|-----------------------|-----------------------|-------------------------------------|-------------------------------------|-----------------------------|-----------------------------|
| –                 | –                          | in/mm                 |                 |                       |                       |                                     |                                     |                             |                             |
| <b>03</b>         | 1/4-28<br>6,35-28          | 1.210<br>30,734       | 0.430<br>10,922 | 0.312<br>7,925        | 0.329<br>8,357        | 0.375<br>9,525                      | 0.188<br>4,775                      | –                           | –                           |
| <b>04</b>         | 1/4-28<br>6,35-28          | 1.338<br>33,985       | 0.430<br>10,922 | 0.312<br>7,925        | 0.329<br>8,357        | 0.375<br>9,525                      | 0.188<br>4,775                      | –                           | –                           |
| <b>05</b>         | 5/16-24<br>7,94-24         | 1.566<br>39,774       | 0.500<br>12,700 | 0.375<br>9,525        | 0.413<br>10,490       | 0.437<br>11,100                     | 0.188<br>4,775                      | –                           | –                           |
| <b>06</b>         | 3/8-24<br>9,52-24          | 1.908<br>48,463       | 0.720<br>18,288 | 0.437<br>11,100       | 0.501<br>12,725       | 0.625<br>15,875                     | 0.250<br>6,350                      | –                           | –                           |
| <b>07</b>         | 7/16-20<br>11,11-20        | 2.125<br>53,975       | 0.720<br>18,288 | 0.500<br>12,700       | 0.584<br>14,834       | 0.625<br>15,875                     | 0.250<br>6,350                      | –                           | –                           |

¹) K version ²) Parts are delivered and marked with PHUFJ/XRE.. or 12CNF.. standard references



### Cross-reference designation system to PHUFJ/XRE.. or 12CNF..

|                                           |                             |   |          |    |   |   |
|-------------------------------------------|-----------------------------|---|----------|----|---|---|
| Examples:                                 | EPHFJ/NAS04GK<br>PHFJ/NAS14 | E | PHFJ/NAS | 04 | G | K |
| <b>Inner ring material</b>                |                             |   |          |    |   |   |
| <b>No code</b>                            | 440C (NAS..R bearing)       |   |          |    |   |   |
| <b>E</b>                                  | PH13.8 (ENAS..R.. bearing)  |   |          |    |   |   |
| <b>Basic designation</b>                  |                             |   |          |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch) |                             |   |          |    |   |   |
| <b>Thread direction</b>                   |                             |   |          |    |   |   |
| <b>No code</b>                            | Right-hand thread           |   |          |    |   |   |
| <b>G</b>                                  | Left-hand thread            |   |          |    |   |   |
| <b>Keyway</b>                             |                             |   |          |    |   |   |
| <b>No code</b>                            | Without keyway              |   |          |    |   |   |
| <b>K</b>                                  | With keyway type K          |   |          |    |   |   |
| <b>W</b>                                  | With deep keyway type W     |   |          |    |   |   |

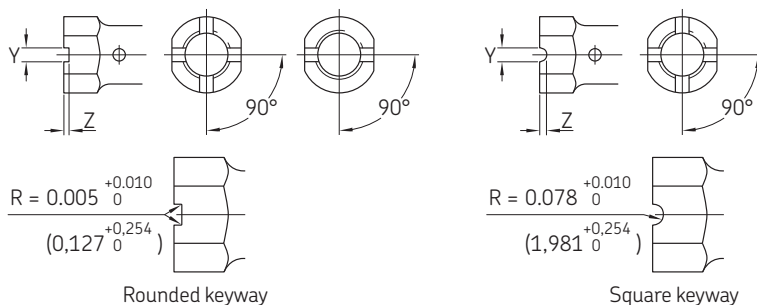
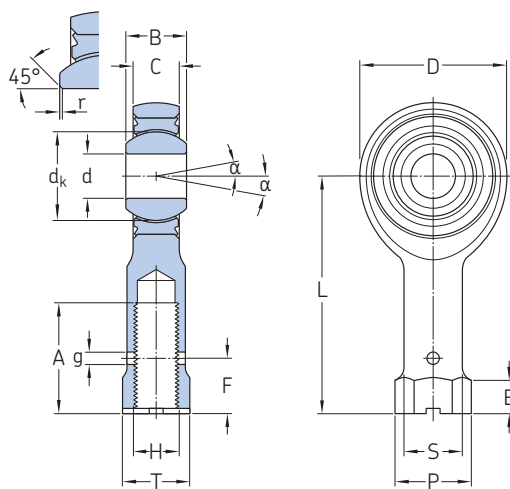
### Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>Z <sup>3)</sup><br>+0.005/0<br>+0,127/0 | Y <sup>3)</sup><br>+0.005/0<br>+0,127/0 | α  | Mass<br>≈   | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque      |
|-------------------|-------------------------------------------------------|-----------------------------------------|----|-------------|--------------------------|--------------------------|----------------------|
| –                 | in/mm                                                 |                                         | °  | lb/g        | lbf/kN                   |                          | lbf-in/Nm            |
| 03                | 0.110<br>2,794                                        | 0.062<br>1,575                          | 10 | 0.044<br>20 | 3 000<br>13,34           | 1 100<br>4,89            | 0.5/6<br>0,056/0,678 |
| 04                | 0.110<br>2,794                                        | 0.093<br>2,362                          | 10 | 0.052<br>24 | 5 500<br>24,46           | 1 300<br>5,78            | 0.5/6<br>0,056/0,678 |
| 05                | 0.110<br>2,794                                        | 0.093<br>2,362                          | 10 | 0.087<br>40 | 8 900<br>39,59           | 2 000<br>8,9             | 1/15<br>0,113/1,695  |
| 06                | 0.110<br>2,794                                        | 0.093<br>2,362                          | 9  | 0.137<br>62 | 13 400<br>59,60          | 3 100<br>13,79           | 1/15<br>0,113/1,695  |
| 07                | 0.110<br>2,794                                        | 0.093<br>2,362                          | 8  | 0.193<br>88 | 18 200<br>80,95          | 4 200<br>18,68           | 1/15<br>0,113/1,695  |

<sup>3)</sup> W version

### 3.32 Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

PHFJ/NAS.. (PHUFJ/XRE.. or 12CNF..) bore code **08** to **16**



|                         |                                                                   |
|-------------------------|-------------------------------------------------------------------|
| Technical specification | AS 81935                                                          |
| Product standard        | AS 81935/9                                                        |
| Rod end body            | PH13.8 passivated                                                 |
| Bearing                 | NAS..R inch (440C inner ring)<br>ENAS..R inch (PH13.8 inner ring) |

| Keyway type | Bore code | Keyway shape | Number of slots |
|-------------|-----------|--------------|-----------------|
| K           | ≤ 06      | Rounded      | 2               |
|             | 07 to 08  | Rounded      | 4               |
|             | ≥ 10      | Square       | 4               |
| W           | All       | Square       | 4               |

#### Dimensions

| Nominal bore code | Dimensions | d                      | D                | B                    | C                | A               | d <sub>k</sub>  | r                | g             |
|-------------------|------------|------------------------|------------------|----------------------|------------------|-----------------|-----------------|------------------|---------------|
|                   |            | 0/-0,0005<br>0/-0,0127 | ±0,010<br>±0,254 | 0/-0,002<br>0/-0,051 | ±0,005<br>±0,127 | Min             | ≈               | ±0,005<br>±0,127 | ≈             |
| in/mm             |            |                        |                  |                      |                  |                 |                 |                  |               |
| <b>08</b>         |            | 0.5000<br>12,700       | 1.459<br>37,059  | 0.500<br>12,700      | 0.400<br>10,160  | 1.250<br>31,750 | 0.781<br>19,838 | 0.010<br>0,254   | 0.07<br>1,778 |
| <b>10</b>         |            | 0.6250<br>15,875       | 1.763<br>44,780  | 0.625<br>15,875      | 0.510<br>12,954  | 1.375<br>34,925 | 0.968<br>24,583 | 0.010<br>0,254   | 0.07<br>1,778 |
| <b>12</b>         |            | 0.7500<br>19,050       | 2.140<br>54,356  | 0.750<br>19,050      | 0.603<br>15,316  | 1.625<br>41,275 | 1.187<br>30,149 | 0.010<br>0,254   | 0.07<br>1,778 |
| <b>14</b>         |            | 0.8750<br>22,225       | 2.372<br>60,249  | 0.875<br>22,225      | 0.713<br>18,110  | 1.875<br>47,625 | 1.314<br>33,370 | 0.010<br>0,254   | 0.07<br>1,778 |
| <b>16</b>         |            | 1.0000<br>25,400       | 2.681<br>68,097  | 1.000<br>25,400      | 0.807<br>20,498  | 2.125<br>53,975 | 1.500<br>38,099 | 0.010<br>0,254   | 0.07<br>1,778 |

#### Dimensions cont.

| Nominal bore code | Dimensions | H                  | L                | P               | F                | S                | T                              | E                              | Z <sup>1)</sup>      | Y <sup>1)</sup>      |
|-------------------|------------|--------------------|------------------|-----------------|------------------|------------------|--------------------------------|--------------------------------|----------------------|----------------------|
|                   |            | UNJF-3B            | ±0,010<br>±0,254 | ≈               | ±0,020<br>±0,508 | ±0,010<br>±0,254 | +0,002/-0,010<br>+0,051/-0,254 | +0,010/-0,062<br>+0,254/-1,575 | +0,005/0<br>+0,127/0 | +0,005/0<br>+0,127/0 |
| in/mm             |            |                    |                  |                 |                  |                  |                                |                                |                      |                      |
| <b>08</b>         |            | 1/2-20<br>12,7-20  | 2.356<br>59,842  | 1.020<br>25,908 | 0.562<br>14,275  | 0.672<br>17,069  | 0.875<br>22,225                | 0.375<br>9,525                 | —                    | —                    |
| <b>10</b>         |            | 5/8-18<br>15,87-18 | 2.707<br>68,758  | 1.020<br>25,908 | 0.687<br>17,450  | 0.845<br>21,463  | 0.875<br>22,225                | 0.375<br>9,525                 | 0.077<br>1,956       | 0.125<br>3,175       |
| <b>12</b>         |            | 3/4-16<br>19,05-16 | 3.193<br>81,102  | 1.300<br>33,020 | 0.812<br>20,625  | 1.017<br>25,832  | 1.125<br>28,575                | 0.500<br>12,700                | 0.077<br>1,956       | 0.125<br>3,175       |
| <b>14</b>         |            | 7/8-14<br>22,22-14 | 3.677<br>93,396  | 1.375<br>34,925 | 0.937<br>23,800  | 1.187<br>30,150  | 1.250<br>31,750                | 0.500<br>12,700                | 0.086<br>2,184       | 0.156<br>3,962       |
| <b>16</b>         |            | 1-12<br>25,4-12    | 4.101<br>104,165 | 1.590<br>40,386 | 1.062<br>26,975  | 1.356<br>34,442  | 1.375<br>34,925                | 0.500<br>12,700                | 0.094<br>2,388       | 0.156<br>3,962       |

<sup>1)</sup> K version <sup>2)</sup> Parts are delivered and marked with PHUFJ/XRE.. or 12CNF.. standard references

# Cross-reference designation system to PHUFJ/XRE.. or 12CNF..

|                                           |                             |   |          |    |   |   |
|-------------------------------------------|-----------------------------|---|----------|----|---|---|
| Examples:                                 | EPHFJ/NAS04GK<br>PHFJ/NAS14 | E | PHFJ/NAS | 04 | G | K |
| <b>Inner ring material</b>                |                             |   |          |    |   |   |
| <b>No code</b>                            | 440C (NAS..R bearing)       |   |          |    |   |   |
| <b>E</b>                                  | PH13.8 (ENAS..R.. bearing)  |   |          |    |   |   |
| <b>Basic designation</b>                  |                             |   |          |    |   |   |
| <b>Bore code</b> (multiples of 1/16 inch) |                             |   |          |    |   |   |
| <b>Thread direction</b>                   |                             |   |          |    |   |   |
| <b>No code</b>                            | Right-hand thread           |   |          |    |   |   |
| <b>G</b>                                  | Left-hand thread            |   |          |    |   |   |
| <b>Keyway</b>                             |                             |   |          |    |   |   |
| <b>No code</b>                            | Without keyway              |   |          |    |   |   |
| <b>K</b>                                  | With keyway type K          |   |          |    |   |   |
| <b>W</b>                                  | With deep keyway type W     |   |          |    |   |   |

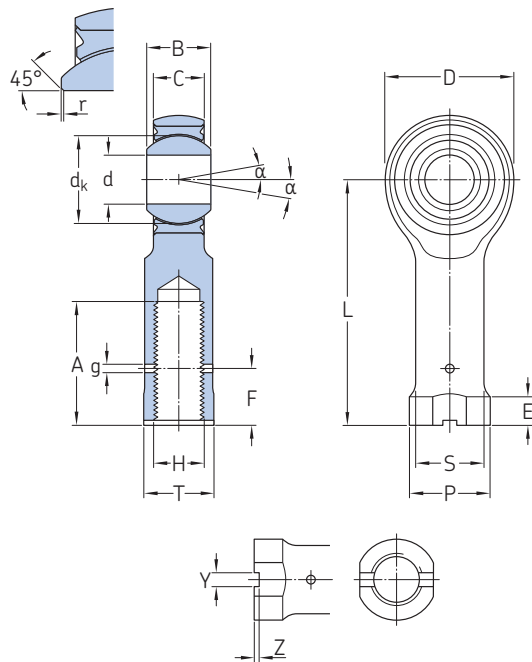
## Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>Z <sup>3)</sup><br>+0.005/0<br>+0,127/0 | Y <sup>3)</sup><br>+0.005/0<br>+0,127/0 | α | Mass<br>≈    | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque     |
|-------------------|-------------------------------------------------------|-----------------------------------------|---|--------------|--------------------------|--------------------------|---------------------|
| –                 | in/mm                                                 |                                         | ° | lb/g         | lbf/kN                   |                          | lbf-in/Nm           |
| 08                | 0.110<br>2,794                                        | 0.093<br>2,362                          | 8 | 0.279<br>127 | 24 600<br>109,42         | 5 700<br>25,35           | 1/15<br>0,113/1,695 |
| 10                | 0.110<br>2,794                                        | 0.125<br>3,175                          | 8 | 0.504<br>229 | 39 500<br>175,70         | 9 200<br>40,92           | 1/15<br>0,113/1,695 |
| 12                | 0.110<br>2,794                                        | 0.125<br>3,175                          | 8 | 0.860<br>390 | 57 200<br>254,43         | 13 500<br>60,05          | 1/15<br>0,113/1,695 |
| 14                | 0.110<br>2,794                                        | 0.156<br>3,962                          | 8 | 1.266<br>574 | 77 800<br>346,05         | 18 400<br>81,85          | 1/24<br>0,113/2,712 |
| 16                | 0.110<br>2,794                                        | 0.156<br>3,962                          | 9 | 1.814<br>823 | 101 000<br>449,25        | 24 000<br>106,75         | 1/24<br>0,113/2,712 |

<sup>3)</sup> W version

### 3.33 Internal thread inserted self-lubricating spherical plain bearing rod end (inch dimensions)

R..F.. bore code **03** to **08**



|                         |                                          |
|-------------------------|------------------------------------------|
| Technical specification | AS 81935                                 |
| Product standard        | NSA 8149                                 |
| Liner                   | X1                                       |
| Inner ring              | Corrosion-resistant steel 440C           |
| Outer ring              | Corrosion-resistant steel 17-4PH H1150   |
| Rod end body            | Corrosion-resistant steel or alloy steel |
| Bearing                 | SW..G inch                               |

#### Dimensions

| Nominal bore code | Dimensions d           | B                    | D                | C                | L                | r                          | T                | P                |
|-------------------|------------------------|----------------------|------------------|------------------|------------------|----------------------------|------------------|------------------|
|                   | 0/-0.0005<br>0/-0,0127 | 0/-0.002<br>0/-0,051 | ±0.010<br>±0,254 | ±0.005<br>±0,127 | ±0.010<br>±0,254 |                            | ±0.010<br>±0,254 | ±0.010<br>±0,254 |
| –                 | in/mm                  |                      |                  |                  |                  |                            |                  |                  |
| <b>03</b>         | 0.1900<br>4,826        | 0.437<br>11,099      | 0.806<br>20,472  | 0.337<br>8,560   | 1.375<br>34,925  | 0.005/0.015<br>0,127/0,381 | 0.437<br>11,099  | 0.500<br>12,700  |
| <b>04</b>         | 0.2500<br>6,350        | 0.437<br>11,099      | 0.806<br>20,472  | 0.337<br>8,560   | 1.469<br>37,312  | 0.005/0.015<br>0,127/0,381 | 0.437<br>11,099  | 0.500<br>12,700  |
| <b>05</b>         | 0.3125<br>7,938        | 0.437<br>11,099      | 0.900<br>22,860  | 0.327<br>8,306   | 1.375<br>34,925  | 0.005/0.015<br>0,127/0,381 | 0.437<br>11,099  | 0.500<br>12,700  |
| <b>06</b>         | 0.3750<br>9,525        | 0.500<br>12,700      | 1.025<br>26,035  | 0.416<br>10,566  | 1.625<br>41,275  | 0.005/0.015<br>0,127/0,381 | 0.582<br>14,782  | 0.625<br>15,875  |
| <b>07</b>         | 0.4375<br>11,113       | 0.562<br>14,274      | 1.150<br>29,210  | 0.452<br>11,481  | 1.812<br>46,024  | 0.005/0.015<br>0,127/0,381 | 0.625<br>15,875  | 0.687<br>17,449  |
| <b>08</b>         | 0.5000<br>12,700       | 0.625<br>15,875      | 1.337<br>33,960  | 0.515<br>13,081  | 2.125<br>53,975  | 0.005/0.015<br>0,127/0,381 | 0.750<br>19,050  | 0.812<br>20,624  |

#### Dimensions cont.

| Nominal bore code | Dimensions F     | E                | H UNJF-3B | A                              | S                              | d <sub>k</sub> ≈ | Z                    | Y                    |
|-------------------|------------------|------------------|-----------|--------------------------------|--------------------------------|------------------|----------------------|----------------------|
|                   | ±0.015<br>±0,381 | ±0.010<br>±0,254 |           | +0.060/-0.030<br>+1,524/-0,762 | +0.005/-0.005<br>+0,127/-0,127 |                  | +0.005/0<br>+0,127/0 | +0.005/0<br>+0,127/0 |
| –                 | in/mm            |                  | –         | in/mm                          |                                |                  |                      |                      |
| <b>03</b>         | 0.380<br>9,652   | 0.250<br>6,350   | 5/16-24   | 0.750<br>19,050                | 0.422<br>10,718                | 0.531<br>13,487  | 0.056<br>1,422       | 0.062<br>1,574       |
| <b>04</b>         | 0.380<br>9,652   | 0.250<br>6,350   | 5/16-24   | 0.750<br>19,050                | 0.422<br>10,718                | 0.531<br>13,487  | 0.056<br>1,422       | 0.062<br>1,574       |
| <b>05</b>         | 0.380<br>9,652   | 0.250<br>6,350   | 5/16-24   | 0.750<br>19,050                | 0.422<br>10,718                | 0.593<br>15,062  | 0.056<br>1,422       | 0.062<br>1,574       |
| <b>06</b>         | 0.440<br>11,176  | 0.250<br>6,350   | 3/16-24   | 0.937<br>23,799                | 0.567<br>14,401                | 0.687<br>17,449  | 0.056<br>1,422       | 0.093<br>2,362       |
| <b>07</b>         | 0.500<br>12,700  | 0.250<br>6,350   | 7/16-20   | 1.062<br>26,975                | 0.610<br>15,494                | 0.781<br>19,837  | 0.069<br>1,752       | 0.093<br>2,362       |
| <b>08</b>         | 0.560<br>14,224  | 0.250<br>6,350   | 1/2-20    | 1.125<br>28,575                | 0.735<br>18,669                | 0.875<br>22,225  | 0.069<br>1,752       | 0.093<br>2,362       |



### Designation system

Examples: R03FLCKS  
R12FR

R

03

F

L

C

K

S

### Basic designation

**Bore code** (multiples of 1/16 inch)

### Thread direction

**R** Right-hand thread  
**L** Left-hand thread

### Surface treatment of rod end body

**No code**<sup>1)</sup> No treatment  
**C** Cadmium plated  
**J**<sup>1)</sup> Zinc-nickel plated

### Keyway

**No code** Without keyway  
**K**<sup>1)</sup> With keyway

### Rod end body material

**No code**<sup>1)</sup> Corrosion-resistant steel 17-4PH H1025  
**S** Alloy steel

<sup>1)</sup> SKF option

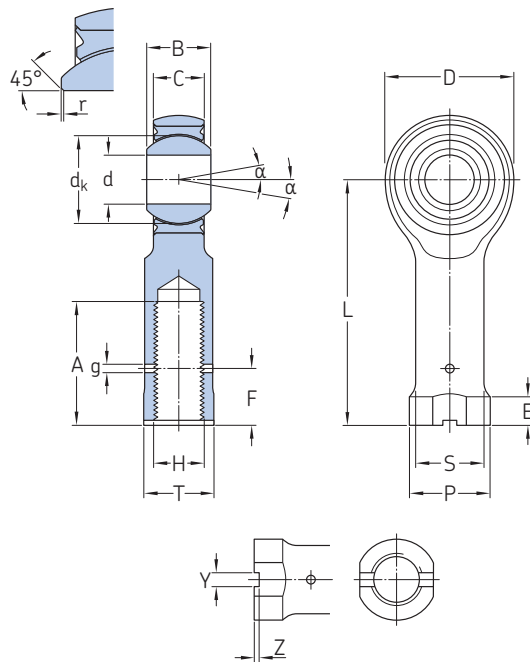
### Dimensions cont., loads and torque

| Nominal bore code | Dimensions<br>g<br>≈ | α  | Mass<br>≈     | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque <sup>2)</sup><br>Max |
|-------------------|----------------------|----|---------------|--------------------------|--------------------------|--------------------------------------|
| –                 | in/mm                | °  | lb/g          | lbf/kN                   |                          | lbf-in/Nm                            |
| <b>03</b>         | 0.07<br>1,778        | 17 | 0.06<br>27,21 | 4 800<br>21,35           | 1 470,25<br>6,54         | 6<br>0,677                           |
| <b>04</b>         | 0.07<br>1,778        | 17 | 0.06<br>27,21 | 4 800<br>21,35           | 2 380,73<br>10,59        | 6<br>0,677                           |
| <b>05</b>         | 0.07<br>1,778        | 14 | 0.07<br>31,75 | 5 500<br>24,47           | 2 769,65<br>12,32        | 10<br>1,129                          |
| <b>06</b>         | 0.07<br>1,778        | 10 | 0.11<br>49,89 | 7 000<br>31,14           | 3 569,97<br>15,88        | 10<br>1,129                          |
| <b>07</b>         | 0.07<br>1,778        | 12 | 0.18<br>81,64 | 8 100<br>36,03           | 4 799,67<br>21,35        | 10<br>1,129                          |
| <b>08</b>         | 0.07<br>1,778        | 9  | 0.28<br>127   | 14 200<br>63,16          | 7 679,48<br>34,16        | 10<br>1,129                          |

<sup>2)</sup> Minimum starting torque limited by zero radial and axial clearance.

### 3.33 Internal thread inserted self-lubricating spherical plain bearing rod end (inch dimensions)

R..F.. bore code **10** to **16B**



|                         |                                          |
|-------------------------|------------------------------------------|
| Technical specification | AS 81935                                 |
| Product standard        | NSA 8149                                 |
| Liner                   | X1                                       |
| Inner ring              | Corrosion-resistant steel 440C           |
| Outer ring              | Corrosion-resistant steel 17-4PH H1150   |
| Rod end body            | Corrosion-resistant steel or alloy steel |
| Bearing                 | SW..G inch                               |

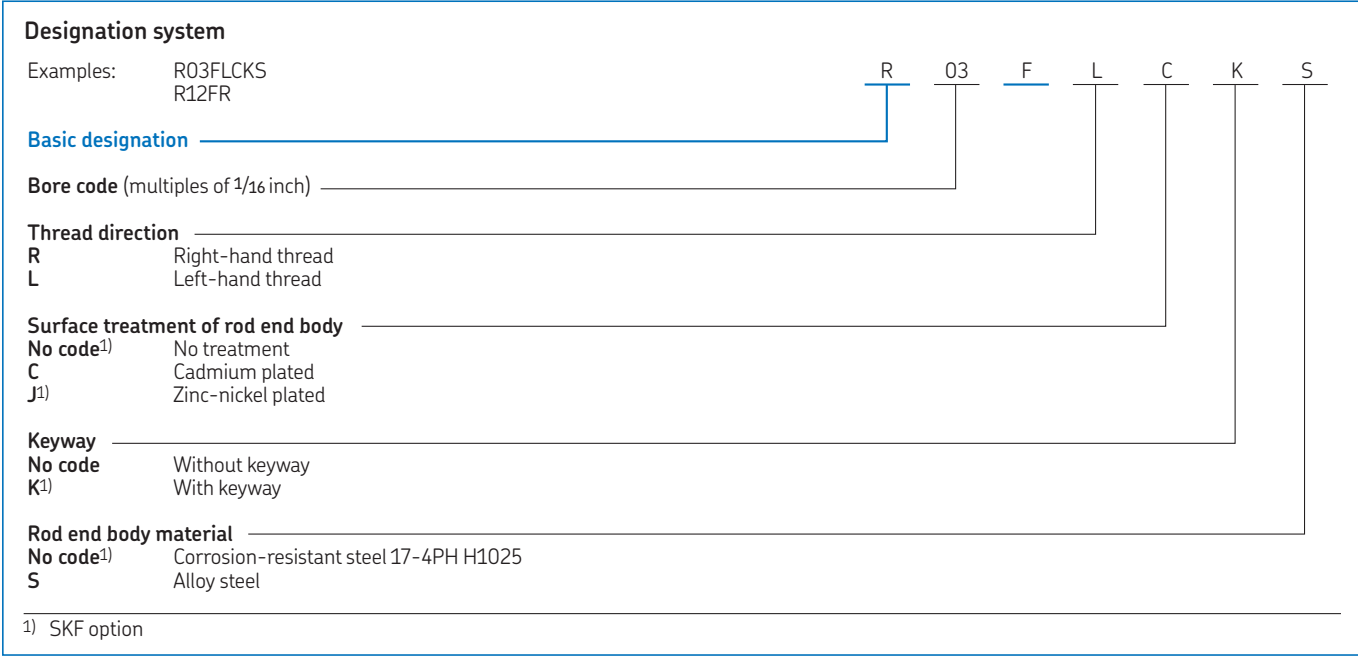
#### Dimensions

| Nominal bore code      | Dimensions d           | B                    | D                | C                | L                | r                          | T                | P                |
|------------------------|------------------------|----------------------|------------------|------------------|------------------|----------------------------|------------------|------------------|
|                        | 0/-0.0005<br>0/-0.0127 | 0/-0.002<br>0/-0.051 | ±0.010<br>±0.254 | ±0.005<br>±0.127 | ±0.010<br>±0.254 |                            | ±0.010<br>±0.254 | ±0.010<br>±0.254 |
| –                      | in/mm                  |                      |                  |                  |                  |                            |                  |                  |
| <b>10</b>              | 0.6250<br>15,875       | 0.750<br>19,050      | 1.525<br>38,735  | 0.577<br>14,656  | 2.625<br>66,675  | 0.005/0.015<br>0,127/0,381 | 0.875<br>22,225  | 1.000<br>25,400  |
| <b>12</b>              | 0.7500<br>19,050       | 0.875<br>22,225      | 1.775<br>45,085  | 0.640<br>16,256  | 2.875<br>73,025  | 0.005/0.015<br>0,127/0,381 | 1.000<br>25,400  | 1.060<br>26,924  |
| <b>14</b>              | 0.8750<br>22,225       | 0.875<br>22,225      | 2.025<br>51,435  | 0.765<br>19,431  | 3.375<br>85,725  | 0.005/0.015<br>0,127/0,381 | 1.125<br>28,575  | 1.187<br>30,150  |
| <b>16<sup>1)</sup></b> | 1.0000<br>25,400       | 1.375<br>34,925      | 2.775<br>70,485  | 1.015<br>25,781  | 4.125<br>104,775 | 0.005/0.015<br>0,127/0,381 | 1.500<br>38,100  | 1.625<br>41,275  |
| <b>16B</b>             | 1.0000<br>25,400       | 1.375<br>34,925      | 2.775<br>70,485  | 1.015<br>25,781  | 4.125<br>104,775 | 0.005/0.015<br>0,127/0,381 | 1.250<br>31,750  | 1.312<br>33,325  |

#### Dimensions cont.

| Nominal bore code      | Dimensions F     | E                | H        | A                              | S                              | d <sub>k</sub>  | Z                    | Y                    |
|------------------------|------------------|------------------|----------|--------------------------------|--------------------------------|-----------------|----------------------|----------------------|
|                        | ±0.015<br>±0.381 | ±0.010<br>±0.254 | UNJF-3B  | +0.060/-0.030<br>+1,524/-0,762 | +0.005/-0.005<br>+0,127/-0,127 | ≈               | +0.005/0<br>+0,127/0 | +0.005/0<br>+0,127/0 |
| –                      | in/mm            |                  | –        | in/mm                          |                                |                 |                      |                      |
| <b>10</b>              | 0.690<br>17,526  | 0.250<br>6,350   | 5/8-20   | 1.500<br>38,100                | 0.860<br>21,844                | 1.062<br>26,974 | 0.077<br>1,955       | 0.125<br>3,175       |
| <b>12</b>              | 0.820<br>20,828  | 0.250<br>6,350   | 3/4-16   | 1.620<br>41,148                | 0.985<br>25,019                | 1.250<br>31,750 | 0.077<br>1,955       | 0.125<br>3,175       |
| <b>14</b>              | 0.940<br>23,876  | 0.250<br>6,350   | 7/8-14   | 1.875<br>47,625                | 1.110<br>28,194                | 1.375<br>34,925 | 0.086<br>2,184       | 0.156<br>3,962       |
| <b>16<sup>1)</sup></b> | 1.070<br>27,178  | 0.250<br>6,350   | 1 1/4-12 | 2.125<br>53,975                | 1.485<br>37,719                | 1.937<br>49,200 | 0.094<br>2,387       | 0.156<br>3,962       |
| <b>16B</b>             | 1.070<br>27,178  | 0.250<br>6,350   | 1-12     | 2.125<br>53,975                | 1.485<br>37,719                | 1.937<br>49,200 | 0.094<br>2,387       | 0.156<br>3,962       |

<sup>1)</sup> SKF option



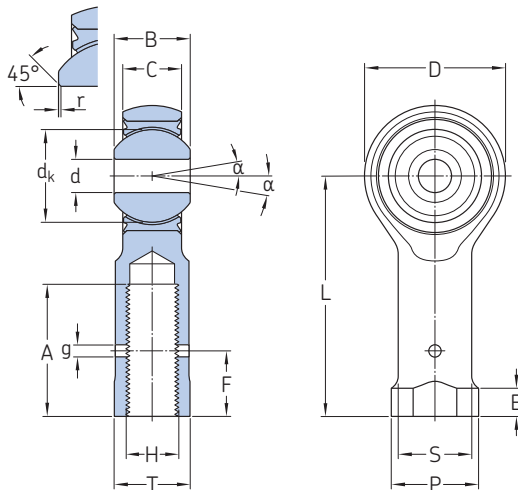
**Dimensions cont., loads and torque**

| Nominal bore code      | Dimensions<br>g<br>≈ | α  | Mass<br>≈      | Radial loads<br>Ultimate | Fatigue<br>50 000 cycles | Starting torque <sup>2)</sup><br>Max |
|------------------------|----------------------|----|----------------|--------------------------|--------------------------|--------------------------------------|
| —                      | in/mm                | °  | lb/g           | lbf/kN                   |                          | lbf-in/Nm                            |
| <b>10</b>              | 0.07<br>1,778        | 12 | 0.42<br>190,50 | 16 150<br>71,84          | 9 178,95<br>40,83        | 10<br>1,129                          |
| <b>12</b>              | 0.07<br>1,778        | 14 | 0.51<br>231,33 | 21 000<br>93,41          | 11 600,14<br>51,6        | 10<br>1,129                          |
| <b>14</b>              | 0.07<br>1,778        | 7  | 0.94<br>426,37 | 26 000<br>115,65         | 13 099,62<br>58,27       | 16<br>1,807                          |
| <b>16<sup>1)</sup></b> | 0.07<br>1,778        | 15 | 1.35<br>612,34 | 55 500<br>246,88         | 30 400,92<br>135,23      | 16<br>1,807                          |
| <b>16B</b>             | 0.07<br>1,778        | 15 | 1.35<br>612,34 | 55 500<br>246,88         | 30 400,92<br>135,23      | 16<br>1,807                          |

2) Minimum starting torque limited by zero radial and axial clearance.

### 3.34 Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

EFJ/RL..R



|                         |                             |
|-------------------------|-----------------------------|
| Technical specification | AS 81820<br>for the bearing |
| Product standard        | –                           |
| Bearing                 | WAS..R inch                 |

#### Dimensions

| Nominal bore code | Dash number multiples of 1/16 inch | Dimensions d           | D                | B                    | C                | A                            | d <sub>k</sub>  | r                | H                   | L                | P                |
|-------------------|------------------------------------|------------------------|------------------|----------------------|------------------|------------------------------|-----------------|------------------|---------------------|------------------|------------------|
|                   |                                    | 0/-0,0005<br>0/-0,0127 | ±0,010<br>±0,254 | 0/-0,002<br>0/-0,051 | ±0,005<br>±0,127 | +0,06/-0,03<br>+1,524/-0,762 | ≈               | ±0,005<br>±0,127 | UNJF-3B             | ±0,010<br>±0,254 | ±0,010<br>±0,254 |
| –                 |                                    | in/mm                  |                  |                      |                  |                              |                 |                  |                     | –                |                  |
| <b>4,83</b>       | <b>03</b>                          | 0.1900<br>4,826        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 0.750<br>19,050              | 0.530<br>13,464 | 0.010<br>0,254   | 5/16-24<br>7,94-24  | 1.375<br>34,925  | 0.500<br>12,700  |
| <b>6,35</b>       | <b>04</b>                          | 0.2500<br>6,350        | 0.806<br>20,472  | 0.437<br>11,100      | 0.337<br>8,56    | 0.750<br>19,050              | 0.530<br>13,464 | 0.010<br>0,254   | 5/16-24<br>7,94-24  | 1.469<br>37,312  | 0.500<br>12,700  |
| <b>7,94</b>       | <b>05</b>                          | 0.3125<br>7,938        | 0.900<br>22,860  | 0.437<br>11,100      | 0.327<br>8,306   | 0.750<br>19,050              | 0.566<br>14,381 | 0.010<br>0,254   | 5/16-24<br>7,94-24  | 1.375<br>34,925  | 0.500<br>12,700  |
| <b>9,52</b>       | <b>06</b>                          | 0.3750<br>9,525        | 1.025<br>26,035  | 0.500<br>12,700      | 0.416<br>10,566  | 0.937<br>23,780              | 0.683<br>17,361 | 0.010<br>0,254   | 3/8-24<br>9,52-24   | 1.625<br>41,275  | 0.625<br>15,875  |
| <b>11,11</b>      | <b>07</b>                          | 0.4375<br>11,113       | 1.150<br>29,210  | 0.562<br>14,275      | 0.452<br>11,481  | 1.062<br>26,975              | 0.777<br>19,744 | 0.010<br>0,254   | 7/16-20<br>11,11-20 | 1.812<br>46,025  | 0.687<br>17,450  |
| <b>12,7</b>       | <b>08</b>                          | 0.5000<br>12,700       | 1.337<br>33,960  | 0.625<br>15,875      | 0.515<br>13,081  | 1.125<br>28,575              | 0.871<br>22,130 | 0.010<br>0,254   | 1/2-20<br>12,7-20   | 2.125<br>53,975  | 0.812<br>20,625  |
| <b>15,87</b>      | <b>10</b>                          | 0.6250<br>15,875       | 1.525<br>38,735  | 0.750<br>19,050      | 0.577<br>14,656  | 1.500<br>38,100              | 1.059<br>26,887 | 0.010<br>0,254   | 5/8-18<br>15,87-18  | 2.625<br>66,675  | 1.000<br>25,400  |
| <b>19,05</b>      | <b>12</b>                          | 0.7500<br>19,050       | 1.775<br>45,085  | 0.875<br>22,225      | 0.640<br>16,256  | 1.620<br>41,148              | 1.216<br>30,897 | 0.010<br>0,254   | 3/4-16<br>19,05-16  | 2.875<br>73,025  | 1.060<br>26,924  |
| <b>22,22</b>      | <b>14</b>                          | 0.8750<br>22,225       | 2.025<br>51,435  | 0.875<br>22,225      | 0.765<br>19,431  | 1.875<br>47,625              | 1.325<br>33,655 | 0.010<br>0,254   | 7/8-14<br>22,22-14  | 3.375<br>85,725  | 1.187<br>30,150  |
| <b>25,4</b>       | <b>16</b>                          | 1.0000<br>25,400       | 2.775<br>70,485  | 1.375<br>34,925      | 1.015<br>25,781  | 2.125<br>53,975              | 1.871<br>47,526 | 0.010<br>0,254   | 1-12<br>25,4-12     | 4.125<br>104,775 | 1.312<br>33,325  |



## Designation system

Examples: XEFJ/RL 6,35RGX  
EFJ/RL22,22

### Rod end body material

**No code** Cadmium plated 30NCD16 steel  
**S** Zinc-nickel plated 30NCD16 steel  
**X** Corrosion-resistant steel 17-4PH H1025  
**T<sup>1)</sup>** Anodized titanium

### Basic designation

### Bore code

### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

### Starting torque

**No code** Standard  
**X** Reduced

<sup>1)</sup> SKF option, masses and load carrying capability reduced compared to steel rod end body

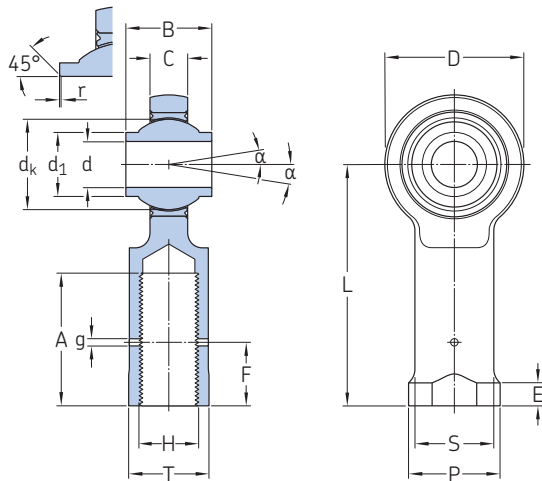
## Dimensions cont., loads and torque

| Nominal bore code | Dash number | Dimensions |      | S      | T             | g     | α  | Mass | Radial loads           |                                | Starting torque |          |
|-------------------|-------------|------------|------|--------|---------------|-------|----|------|------------------------|--------------------------------|-----------------|----------|
|                   |             | F          | E    | ±0,005 | +0,003/-0,010 | ≈     |    | ≈    | Ultimate <sup>1)</sup> | Fatigue 10 <sup>6</sup> cycles | Standard        | Reduced  |
|                   |             | ±0,381     | ≈    | ±0,127 | +1,524/-0,762 |       |    |      |                        |                                |                 |          |
|                   |             | in/mm      |      |        |               |       | °  | lb/g | lbf/kN                 |                                | lbf-in/Nm       |          |
| <b>4,83</b>       | <b>03</b>   | 0,380      | 0,25 | 0,422  | 0,437         | 0,07  | 16 | 0,07 | 6 195                  | 1 052                          | 0,53/10         | 1,1 max  |
|                   |             | 9,652      | 6,35 | 10,719 | 11,100        | 1,778 |    | 32   | 27,56                  | 4,68                           | 0,06/1,12       | 0,12 max |
| <b>6,35</b>       | <b>04</b>   | 0,380      | 0,25 | 0,422  | 0,437         | 0,07  | 16 | 0,07 | 6 195                  | 1 052                          | 0,53/10         | 1,1 max  |
|                   |             | 9,652      | 6,35 | 10,719 | 11,100        | 1,778 |    | 32   | 27,56                  | 4,68                           | 0,06/1,12       | 0,12 max |
| <b>7,94</b>       | <b>05</b>   | 0,380      | 0,25 | 0,422  | 0,437         | 0,07  | 15 | 0,10 | 7 585                  | 1 090                          | 1/10            | 2 max    |
|                   |             | 9,652      | 6,35 | 10,719 | 11,100        | 1,778 |    | 45   | 33,74                  | 4,85                           | 0,11/1,12       | 0,22 max |
| <b>9,52</b>       | <b>06</b>   | 0,440      | 0,25 | 0,567  | 0,582         | 0,07  | 9  | 0,12 | 8 940                  | 1 513                          | 1/10            | 2 max    |
|                   |             | 11,176     | 6,35 | 14,402 | 14,782        | 1,778 |    | 55   | 39,77                  | 6,73                           | 0,11/1,12       | 0,22 max |
| <b>11,11</b>      | <b>07</b>   | 0,500      | 0,25 | 0,610  | 0,625         | 0,07  | 11 | 0,20 | 9 595                  | 1 920                          | 1/10            | 2 max    |
|                   |             | 12,700     | 6,35 | 15,494 | 15,875        | 1,778 |    | 92   | 42,68                  | 8,54                           | 0,11/1,12       | 0,22 max |
| <b>12,7</b>       | <b>08</b>   | 0,560      | 0,25 | 0,735  | 0,750         | 0,07  | 9  | 0,28 | 18 750                 | 3 069                          | 1/10            | 2 max    |
|                   |             | 14,224     | 6,35 | 18,669 | 19,050        | 1,778 |    | 140  | 83,40                  | 13,65                          | 0,11/1,12       | 0,22 max |
| <b>15,87</b>      | <b>10</b>   | 0,690      | 0,25 | 0,860  | 0,875         | 0,07  | 12 | 0,45 | 20 680                 | 3 480                          | 1/10            | 2 max    |
|                   |             | 17,526     | 6,35 | 21,844 | 22,225        | 1,778 |    | 205  | 91,99                  | 15,48                          | 0,11/1,12       | 0,22 max |
| <b>19,05</b>      | <b>12</b>   | 0,820      | 0,25 | 0,985  | 1,000         | 0,07  | 13 | 0,55 | 27 795                 | 4 586                          | 1/10            | 2 max    |
|                   |             | 20,828     | 6,35 | 25,019 | 25,400        | 1,778 |    | 250  | 123,64                 | 20,40                          | 0,11/1,12       | 0,22 max |
| <b>22,22</b>      | <b>14</b>   | 0,940      | 0,25 | 1,110  | 1,125         | 0,07  | 6  | 1,00 | 31 725                 | 5 348                          | 2/15,9          | 4,1 max  |
|                   |             | 23,876     | 6,35 | 28,194 | 28,575        | 1,778 |    | 450  | 141,12                 | 23,79                          | 0,23/1,8        | 0,46 max |
| <b>25,4</b>       | <b>16</b>   | 1,070      | 0,25 | 1,235  | 1,250         | 0,07  | 12 | 1,45 | 71 745                 | 8 377                          | 2/15,9          | 4,1 max  |
|                   |             | 27,178     | 6,35 | 31,369 | 31,750        | 1,778 |    | 660  | 319,14                 | 37,26                          | 0,23/1,8        | 0,46 max |

<sup>1)</sup> Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

### 3.35 Internal thread inserted high misalignment self-lubricating spherical plain bearing rod end (inch dimensions)

EFJ/RT..R



|                         |             |
|-------------------------|-------------|
| Technical specification | –           |
| Product standard        | –           |
| Bearing                 | XRT..R inch |

3.35

#### Dimensions

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions |               | B        | C      | A             | H        | d <sub>k</sub> | d <sub>1</sub> | r        | L       | P      |
|-------------------|---------------------------------------|------------|---------------|----------|--------|---------------|----------|----------------|----------------|----------|---------|--------|
|                   |                                       | d          | D             |          |        |               |          |                |                |          |         |        |
|                   |                                       | 0/–0.0005  | +0.035/–0.010 | 0/–0.005 | ±0.005 | +0.06/–0.03   | UNJF-3B  | ≈              | ≈              | +0.012/0 | ±0.010  | ±0.010 |
|                   |                                       | 0/–0.0127  | +889/–0.254   | 0/–0.127 | ±0.127 | +1,524/–0,762 |          |                |                | +0,3/0   | ±0,254  | ±0,254 |
| –                 |                                       | in/mm      |               |          |        |               | –        | in/mm          |                |          |         |        |
| <b>4,83</b>       | <b>03</b>                             | 0.1900     | 0.750         | 0.500    | 0.220  | 0.750         | 5/16–24  | 0.437          | 0.315          | 0.004    | 1.375   | 0.500  |
|                   |                                       | 4,826      | 19,050        | 12,700   | 5,588  | 19,050        | 7,94–24  | 11,100         | 8,001          | 0,100    | 34,925  | 12,700 |
| <b>6,35</b>       | <b>04</b>                             | 0.2500     | 1.000         | 0.593    | 0.265  | 0.937         | 3/8–24   | 0.594          | 0.386          | 0.004    | 1.625   | 0.625  |
|                   |                                       | 6,350      | 25,400        | 15,062   | 6,731  | 23,780        | 9,52–24  | 15,080         | 9,804          | 0,100    | 41,275  | 15,875 |
| <b>7,94</b>       | <b>05</b>                             | 0.3125     | 1.125         | 0.813    | 0.355  | 1.062         | 7/16–20  | 0.781          | 0.512          | 0.004    | 1.812   | 0.687  |
|                   |                                       | 7,938      | 28,575        | 20,650   | 9,017  | 26,975        | 11,11–20 | 19,838         | 13,005         | 0,100    | 46,025  | 17,450 |
| <b>9,52</b>       | <b>06</b>                             | 0.3750     | 1.125         | 0.813    | 0.355  | 1.062         | 7/16–20  | 0.781          | 0.532          | 0.004    | 1.812   | 0.687  |
|                   |                                       | 9,525      | 28,575        | 20,650   | 9,017  | 26,975        | 11,11–20 | 19,838         | 13,513         | 0,100    | 46,025  | 17,450 |
| <b>11,11</b>      | <b>07</b>                             | 0.4375     | 1.312         | 0.875    | 0.355  | 1.125         | 1/2–20   | 0.866          | 0.620          | 0.004    | 2.125   | 0.812  |
|                   |                                       | 11,113     | 33,325        | 22,225   | 9,017  | 28,575        | 12,7–20  | 22,000         | 15,748         | 0,100    | 53,975  | 20,625 |
| <b>12,7</b>       | <b>08</b>                             | 0.5000     | 1.500         | 0.937    | 0.411  | 1.500         | 5/8–18   | 0.984          | 0.728          | 0.004    | 2.625   | 1.000  |
|                   |                                       | 12,700     | 38,100        | 23,799   | 10,439 | 38,100        | 15,87–18 | 25,000         | 18,491         | 0,100    | 66,675  | 25,400 |
| <b>15,87</b>      | <b>10</b>                             | 0.6250     | 1.750         | 1.200    | 0.577  | 1.750         | 3/4–16   | 1.240          | 0.857          | 0.004    | 2.875   | 1.060  |
|                   |                                       | 15,875     | 44,450        | 30,480   | 14,656 | 44,450        | 19,05–16 | 31,500         | 21,768         | 0,100    | 73,025  | 26,924 |
| <b>19,05</b>      | <b>12</b>                             | 0.7500     | 2.000         | 1.280    | 0.630  | 1.875         | 7/8–14   | 1.339          | 0.963          | 0.004    | 3.375   | 1.187  |
|                   |                                       | 19,050     | 50,800        | 32,512   | 16,002 | 47,625        | 22,22–14 | 34,000         | 24,460         | 0,100    | 85,725  | 30,150 |
| <b>22,22</b>      | <b>14</b>                             | 0.8750     | 2.200         | 1.400    | 0.635  | 2.000         | 7/8–14   | 1.531          | 1.122          | 0.004    | 3.375   | 1.187  |
|                   |                                       | 22,225     | 55,880        | 35,560   | 16,219 | 50,800        | 22,22–14 | 38,887         | 28,500         | 0,100    | 85,725  | 30,150 |
| <b>25,4</b>       | <b>16</b>                             | 1.0000     | 2.750         | 1.875    | 0.845  | 2.125         | 1 1/4–12 | 1.875          | 1.272          | 0.004    | 4.125   | 2.020  |
|                   |                                       | 25,400     | 69,850        | 47,625   | 21,463 | 53,975        | 31,75–12 | 47,625         | 32,309         | 0,100    | 104,775 | 51,308 |

## Designation system

Examples: XEFJ/RT 6,35RGX  
EFJ/RT22,22

### Rod end body material

**No code** Cadmium plated 30NCD16 steel  
**S** Zinc-nickel plated 30NCD16 steel  
**X** Corrosion-resistant steel 17-4PH H1025  
**T<sup>1)</sup>** Anodized titanium

### Basic designation

### Bore code

### Thread direction

**No code** Right-hand thread  
**G** Left-hand thread

### Starting torque

**No code** Standard  
**X** Reduced

1) SKF option, masses and load carrying capability reduced compared to steel rod end body

## Dimensions cont., loads and torque

| Nominal bore code | Dash number<br>multiples of 1/16 inch | Dimensions    |                       | E<br>≈       | S<br>±0.005<br>±0,127 | T<br>±0.010<br>±0,254 | α  | Mass<br>≈   | Radial loads           |                                   | Starting torque      |                   |
|-------------------|---------------------------------------|---------------|-----------------------|--------------|-----------------------|-----------------------|----|-------------|------------------------|-----------------------------------|----------------------|-------------------|
|                   |                                       | g<br>≈        | F<br>±0.015<br>±0,381 |              |                       |                       |    |             | Ultimate <sup>1)</sup> | Fatigue<br>10 <sup>6</sup> cycles | Standard             | Reduced           |
| –                 |                                       | in/mm         |                       |              |                       |                       | °  | lb/g        | lbf/kN                 |                                   | lbf-in/Nm            |                   |
| 4,83              | 03                                    | 0.07<br>1,778 | 0.380<br>9,652        | 0.25<br>6,35 | 0.422<br>10,719       | 0.437<br>11,100       | 15 | 0.07<br>31  | 4800<br>21,35          | 762<br>3,39                       | 0.53/5<br>0,06/0,56  | 1 max<br>0,12 max |
| 6,35              | 04                                    | 0.07<br>1,778 | 0.440<br>11,176       | 0.25<br>6,35 | 0.567<br>14,402       | 0.582<br>14,782       | 24 | 0.13<br>60  | 8185<br>36,41          | 1 311<br>5,83                     | 0.53/5<br>0,06/0,56  | 1 max<br>0,12 max |
| 7,94              | 05                                    | 0.07<br>1,778 | 0.500<br>12,700       | 0.25<br>6,35 | 0.610<br>15,494       | 0.625<br>15,875       | 23 | 0.19<br>85  | 8620<br>38,34          | 1 414<br>6,29                     | 0.7/7<br>0,08/0,8    | 2 max<br>0,22 max |
| 9,52              | 06                                    | 0.07<br>1,778 | 0.500<br>12,700       | 0.25<br>6,35 | 0.610<br>15,494       | 0.625<br>15,875       | 22 | 0.19<br>85  | 8620<br>38,34          | 1 414<br>6,29                     | 0.88/9<br>0,10/1,02  | 2 max<br>0,22 max |
| 11,11             | 07                                    | 0.07<br>1,778 | 0.560<br>14,224       | 0.25<br>6,35 | 0.735<br>18,669       | 0.750<br>19,050       | 22 | 0.31<br>140 | 13025<br>57,94         | 2 104<br>9,36                     | 0.88/9<br>0,10/1,02  | 2 max<br>0,22 max |
| 12,7              | 08                                    | 0.07<br>1,778 | 0.690<br>17,526       | 0.25<br>6,35 | 0.860<br>21,844       | 0.875<br>22,225       | 20 | 0.49<br>220 | 18165<br>80,80         | 2 947<br>13,11                    | 0.88/9<br>0,10/1,02  | 2 max<br>0,22 max |
| 15,87             | 10                                    | 0.07<br>1,778 | 0.820<br>20,828       | 0.25<br>6,35 | 0.985<br>25,019       | 1.000<br>25,400       | 20 | 0.71<br>321 | 24010<br>106,80        | 3 973<br>17,67                    | 1/12.4<br>0,11/1,4   | 2 max<br>0,22 max |
| 19,05             | 12                                    | 0.07<br>1,778 | 0.940<br>23,876       | 0.25<br>6,35 | 1.110<br>28,194       | 1.125<br>28,575       | 19 | 0.97<br>440 | 26990<br>120,06        | 5 052<br>22,47                    | 1/12.4<br>0,11/1,4   | 2 max<br>0,22 max |
| 22,22             | 14                                    | 0.07<br>1,778 | 0.940<br>23,876       | 0.25<br>6,35 | 1.110<br>28,194       | 1.125<br>28,575       | 19 | 1.11<br>501 | 28880<br>128,46        | 5 295<br>23,55                    | 2.21/18<br>0,25/2,04 | 4 max<br>0,46 max |
| 25,4              | 16                                    | 0.07<br>1,778 | 1.070<br>27,178       | 0.25<br>6,35 | 1.688<br>42,875       | 1.250<br>31,750       | 21 | 2.00<br>908 | 60230<br>267,92        | 9 858<br>43,85                    | 2.21/18<br>0,25/2,04 | 4 max<br>0,46 max |

1) Loads are valid for rod end bodies made of alloy steel or corrosion resistant steel. For other rod ends, refer to page 292

# Cross-reference

## Ball bearing rod ends

### Metric bearings

3

| EN part number | SKF designation |
|----------------|-----------------|
| EN3541Ld'EKA   | CdMJEGRN741     |
| EN3541Ld'EKB   | CdMJEGRN811     |
| EN3541Ld'ETA   | CdMJGRN741      |
| EN3541Ld'ETB   | CdMJGRN811      |
| EN3541Ld'PKA   | CdMJGRN741      |
| EN3541Ld'PKB   | CdMJGRN811      |
| EN3541Ld'PTA   | CdMJGRN741      |
| EN3541Ld'PTB   | CdMJGRN811      |
| EN3541Rd'EKA   | CdMJERN741      |
| EN3541Rd'EKB   | CdMJERN811      |
| EN3541Rd'ETA   | CdMJERN741      |
| EN3541Rd'ETB   | CdMJERN811      |
| EN3541Rd'PKA   | CdMJRN741       |
| EN3541Rd'PKB   | CdMJRN811       |
| EN3541Rd'PTA   | CdMJRN741       |
| EN3541Rd'PTB   | CdMJRN811       |
| EN4036Ld'EKA   | XCdMJEGRN741    |
| EN4036Ld'EKB   | XCdMJEGRN811    |
| EN4036Ld'ENA   | XCdMJGRN741     |
| EN4036Ld'ENB   | XCdMJGRN811     |
| EN4036Ld'EMA   | XCdMJGRK2N741   |
| EN4036Ld'EMB   | XCdMJGRK2N811   |
| EN4036Ld'PKA   | XCdMJGRN741     |
| EN4036Ld'PKB   | XCdMJGRN811     |
| EN4036Ld'PNA   | XCdMJGRN741     |
| EN4036Ld'PNB   | XCdMJGRN811     |
| EN4036Ld'PMA   | XCdMJGRK2N741   |

| EN part number        |                        | SKF designation        |
|-----------------------|------------------------|------------------------|
| EN4036L <b>d</b> 'PMB | EN4036L <b>d</b> 'PMBT | XC <b>d</b> MJGRK2N811 |
| EN4036R <b>d</b> 'EKA | EN4036R <b>d</b> 'EKAT | XC <b>d</b> MJERKN741  |
| EN4036R <b>d</b> 'EKB | EN4036R <b>d</b> 'EKBT | XC <b>d</b> MJERKN811  |
| EN4036R <b>d</b> 'ENA | EN4036R <b>d</b> 'ENAT | XC <b>d</b> MJERN741   |
| EN4036R <b>d</b> 'ENB | EN4036R <b>d</b> 'ENBT | XC <b>d</b> MJERN811   |
| EN4036R <b>d</b> 'EMA | EN4036R <b>d</b> 'EMAT | XC <b>d</b> MJERK2N741 |
| EN4036R <b>d</b> 'EMB | EN4036R <b>d</b> 'EMBT | XC <b>d</b> MJERK2N811 |
| EN4036R <b>d</b> 'PKA | EN4036R <b>d</b> 'PKAT | XC <b>d</b> MJRKN741   |
| EN4036R <b>d</b> 'PKB | EN4036R <b>d</b> 'PKBT | XC <b>d</b> MJRKN811   |
| EN4036R <b>d</b> 'PNA | EN4036R <b>d</b> 'PNAT | XC <b>d</b> MJRN741    |
| EN4036R <b>d</b> 'PNB | EN4036R <b>d</b> 'PNBT | XC <b>d</b> MJRN811    |
| EN4036R <b>d</b> 'PMA | EN4036R <b>d</b> 'PMAT | XC <b>d</b> MJRK2N741  |
| EN4036R <b>d</b> 'PMB | EN4036R <b>d</b> 'PMBT | XC <b>d</b> MJRK2N811  |

Where

**d** = Bore code

**d'** = 05 for bore code = 5, 06 for bore code = N 6,  
08 for bore code = N 8, 10 for bore code = N10

Example

| EN part number        |                        | SKF designation           |
|-----------------------|------------------------|---------------------------|
| EN3541L <b>05</b> EKA |                        | C <b>5</b> MJEGRKN741     |
| EN4036R <b>08</b> PMB | EN4036R <b>08</b> PMBT | XCN <b>8</b> MJRK2N811    |
| EN4036L <b>10</b> EMB | EN4036L <b>10</b> EMBT | XCN <b>10</b> MJEGRK2N811 |

## Inch bearings

| EN part number | SKF designation |               |
|----------------|-----------------|---------------|
| EN4156Ld'EK1AR | WCNdExGKG74     | WCNdEx'GK2G74 |
| EN4156Ld'EK2AR | WCNdExGK2G74    | WCNdEx'GKG74  |
| EN4156Ld'PK1AR | WCNd-xGKG74     | WCNd-x'GK2G74 |
| EN4156Ld'PK2AR | WCNd-xGK2G74    | WCNd-x'GKG74  |
| EN4156Rd'EK1AR | WCNdExKG74      | WCNdEx'K2G74  |
| EN4156Rd'EK2AR | WCNdExK2G74     | WCNdEx'KG74   |
| EN4156Rd'PK1AR | WCNd-xKG74      | WCNd-x'K2G74  |
| EN4156Rd'PK2AR | WCNd-xK2G74     | WCNd-x'KG74   |
| EN4156Ld'EK1BR | WCNdExGKG81     | WCNdEx'GK2G81 |
| EN4156Ld'EK2BR | WCNdExGK2G81    | WCNdEx'GKG81  |
| EN4156Ld'PK1BR | WCNd-xGKG81     | WCNd-x'GK2G81 |
| EN4156Ld'PK2BR | WCNd-xGK2G81    | WCNd-x'GKG81  |
| EN4156Rd'EK1BR | WCNdExKG81      | WCNdEx'K2G81  |
| EN4156Rd'EK2BR | WCNdExK2G81     | WCNdEx'KG81   |
| EN4156Rd'PK1BR | WCNd-xKG81      | WCNd-x'K2G81  |
| EN4156Rd'PK2BR | WCNd-xK2G81     | WCNd-x'KG81   |
| EN4156Ld'EK1CR | WCNdExGK        | WCNdEx'GK2    |
| EN4156Ld'EK2CR | WCNdExGK2       | WCNdEx'GK     |
| EN4156Ld'PK1CR | WCNd-xGK        | WCNd-x'GK2    |
| EN4156Ld'PK2CR | WCNd-xGK2       | WCNd-x'GK     |
| EN4156Rd'EK1CR | WCNdExK         | WCNdEx'K2     |
| EN4156Rd'EK2CR | WCNdExK2        | WCNdEx'K      |
| EN4156Rd'PK1CR | WCNd-xK         | WCNd-x'K2     |
| EN4156Rd'PK2CR | WCNd-xK2        | WCNd-x'K      |
| EN4157Ld'EK1AR | CNdExGK         | CNdEx'GK2     |
| EN4157Ld'EK2AR | CNdExGK2        | CNdEx'GK      |
| EN4157Ld'PK1AR | CNd-xGK         | CNd-x'GK2     |

| EN part number | SKF designation |              |
|----------------|-----------------|--------------|
| EN4157Ld'PK2AR | CNd-xGK2        | CNd-x'GK     |
| EN4157Rd'EK1AR | CNdExK          | CNdEx'K2     |
| EN4157Rd'EK2AR | CNdExK2         | CNdEx'K      |
| EN4157Rd'PK1AR | CNd-xK          | CNd-x'K2     |
| EN4157Rd'PK2AR | CNd-xK2         | CNd-x'K      |
| EN4157Ld'EK1BR | CNdExGKG81      | CNdEx'GK2G81 |
| EN4157Ld'EK2BR | CNdExGK2G81     | CNdEx'GKG81  |
| EN4157Ld'PK1BR | CNd-xGKG81      | CNd-x'GK2G81 |
| EN4157Ld'PK2BR | CNd-xGK2G81     | CNd-x'GKG81  |
| EN4157Rd'EK1BR | CNdExKG81       | CNdEx'K2G81  |
| EN4157Rd'EK2BR | CNdExK2G81      | CNdEx'KG81   |
| EN4157Rd'PK1BR | CNd-xKG81       | CNd-x'K2G81  |
| EN4157Rd'PK2BR | CNd-xK2G81      | CNd-x'KG81   |

Where

**d..x** = Bore code, except for d..x = 6,35..6 / 7,94..7 and 9,52..9

**d..x'** = Bore code with d..x' = 6,35..6 / 7,94..7 or 9,52..9

**d'** = Incremental number from 01 to 07, 10 to 15 and 20 to 24 in the order of bore codes given pages 57 to 62

**Example**

| EN part number | SKF designation         |
|----------------|-------------------------|
| EN4156L01EK1AR | WCN <b>6,35E4</b> GKG74 |
| EN4157R10PK2BR | CN <b>7,94-5</b> K2G81  |

| AS part number | SKF designation  |
|----------------|------------------|
| MS21151-1GE    | SREP 3ML3SK1     |
| MS21151-1G     | REP 3ML3SK1      |
| MS21151-1E     | SREP 3ML3S181    |
| MS21151-1      | REP 3ML3S181     |
| MS21151-2GE    | SREP 3MR3SK1     |
| MS21151-2G     | REP 3MR3SK1      |
| MS21151-2E     | SREP 3MR3S181    |
| MS21151-2      | REP 3MR3S181     |
| MS21151-3GE    | SREP 3M6ASK1     |
| MS21151-3G     | REP 3M6ASK1      |
| MS21151-3E     | SREP 3M6AS181    |
| MS21151-3      | REP 3M6AS181     |
| MS21151-3CGE   | SREP 3MS6ASK1    |
| MS21151-3CG    | REP 3MS6ASK1     |
| MS21151-3CE    | SREP 3MS6AS181   |
| MS21151-3C     | REP 3MS6AS181    |
| MS21151-4GE    | SREP 3M6-2NSK1   |
| MS21151-4G     | REP 3M6-2NSK1    |
| MS21151-4E     | SREP 3M6-2NS181  |
| MS21151-4      | REP 3M6-2NS181   |
| MS21151-4CGE   | SREP 3MS6-2NSK1  |
| MS21151-4CG    | REP 3MS6-2NSK1   |
| MS21151-4CE    | SREP 3MS6-2NS181 |
| MS21151-4C     | REP 3MS6-2NS181  |
| MS21151-5GE    | SREP 3ML6-2NSK1  |
| MS21151-5G     | REP 3ML6-2NSK1   |
| MS21151-5E     | SREP 3ML6-2NS181 |
| MS21151-5      | REP 3ML6-2NS181  |
| MS21151-5CGE   | SREP 3MLS6NSK1   |
| MS21151-5CG    | REP 3MLS6NSK1    |
| MS21151-5CE    | SREP 3MS6NS181   |
| MS21151-5C     | REP 3MS6NS181    |
| MS21151-6GE    | SRAP 3M4-2SK1    |
| MS21151-6G     | RAP 3M4-2SK1     |
| MS21151-6E     | SRAP 3M4-2S181   |
| MS21151-6      | RAP 3M4-2S181    |
| MS21151-6CGE   | SRAP 3MS4-2SK1   |
| MS21151-6CG    | RAP 3MS4-2SK1    |
| MS21151-6CE    | SRAP 3MS4-2S181  |
| MS21151-6C     | RAP 3MS4-2S181   |
| MS21151-7GE    | SREP 3M4-6SK1    |
| MS21151-7G     | REP 3M4-6SK1     |
| MS21151-7E     | SREP 3M4-6S181   |
| MS21151-7      | REP 3M4-6S181    |
| MS21151-7CGE   | SREP 3MS4-6SK1   |
| MS21151-7CG    | REP 3MS4-6SK1    |
| MS21151-7CE    | SREP 3MS4-6S181  |
| MS21151-7C     | REP 3MS4-6S181   |

| AS part number | SKF designation |
|----------------|-----------------|
| MS21151-8GE    | SREP 4M6SK1     |
| MS21151-8G     | REP 4M6SK1      |
| MS21151-8E     | SREP 4M6S181    |
| MS21151-8      | REP 4M6S181     |
| MS21151-8CGE   | SREP 4M6-4SK1   |
| MS21151-8CG    | REP 4M6-4SK1    |
| MS21151-8CE    | SREP 4M6-4S181  |
| MS21151-8C     | REP 4M6-4S181   |
| MS21151-9GE    | SREP 4ML6SK1    |
| MS21151-9G     | REP 4ML6SK1     |
| MS21151-9E     | SREP 4ML6S181   |
| MS21151-9      | REP 4ML6S181    |
| MS21151-9CGE   | SREP 4ML6-4SK1  |
| MS21151-9CG    | REP 4ML6-4SK1   |
| MS21151-9CE    | SREP 4ML6-4S181 |
| MS21151-9C     | REP 4ML6-4S181  |
| MS21151-10GE   | SREP 5M6SK1     |
| MS21151-10G    | REP 5M6SK1      |
| MS21151-10E    | SREP 5M6S181    |
| MS21151-10     | REP 5M6S181     |
| MS21151-10CGE  | SREP 5M6-2SK1   |
| MS21151-10CG   | REP 5M6-2SK1    |
| MS21151-10CE   | SREP 5M6-2S181  |
| MS21151-10C    | REP 5M6-2S181   |
| MS21151-11GE   | SREP 5M7SK1     |
| MS21151-11G    | REP 5M7SK1      |
| MS21151-11E    | SREP 5M7S181    |
| MS21151-11     | REP 5M7S181     |
| MS21151-11CGE  | SREP 5MS7SK1    |
| MS21151-11CG   | REP 5MS7K1      |
| MS21151-11CE   | SREP 5MS7S181   |
| MS21151-11C    | REP 5MS7S181    |
| MS21151-12GE   | SREP 5M10SK1    |
| MS21151-12G    | REP 5M10SK1     |
| MS21151-12E    | SREP 5M10S181   |
| MS21151-12     | REP 5M10S181    |
| MS21151-12CGE  | SREP 5MS10SK1   |
| MS21151-12CG   | REP 5MS10K1     |
| MS21151-12CE   | SREP 5MS10S181  |
| MS21151-12C    | REP 5MS10S181   |
| MS21151-13GE   | SRAP10M10SK1    |
| MS21151-13G    | RAP10M10SK1     |
| MS21151-13E    | SRAP10M10S181   |
| MS21151-13     | RAP10M10S181    |
| MS21151-13CGE  | SRAP10MS10SK1   |
| MS21151-13CG   | RAP10MS10K1     |
| MS21151-13CE   | SRAP10MS10S181  |
| MS21151-13C    | RAP10MS10S181   |

| AS part number | SKF designation |
|----------------|-----------------|
| MS21153-1GE    | SREPB 3NSK1     |
| MS21153-1G     | REPB 3NSK1      |
| MS21153-1E     | SREPB 3NS181    |
| MS21153-1      | REPB 3NS181     |
| MS21153-2GE    | SREPB 3N-2SK1   |
| MS21153-2G     | REPB 3N-2SK1    |
| MS21153-2E     | SREPB 3N-2S181  |
| MS21153-2      | REPB 3N-2S181   |
| MS21153-3GE    | SREP 3F4SK1     |
| MS21153-3G     | REP 3F4SK1      |
| MS21153-3E     | SREP 3F4S181    |
| MS21153-3      | REP 3F4S181     |
| MS21153-4GE    | SREP 3FL4SK1    |
| MS21153-4G     | REP 3FL4SK1     |
| MS21153-4E     | SREP 3FL4S181   |
| MS21153-4      | REP 3FL4S181    |
| MS21153-5GE    | SREP 3FL4-3SK1  |
| MS21153-5G     | REP 3FL4-3SK1   |
| MS21153-5E     | SREP 3FL4-3S181 |
| MS21153-5      | REP 3FL4-3S181  |
| MS21153-6GE    | SREP 4F5SK1     |
| MS21153-6G     | REP 4F5SK1      |
| MS21153-6E     | SREP 4F5S181    |
| MS21153-6      | REP 4F5S181     |
| MS21153-6CGE   | SREP 4F5KSK1    |
| MS21153-6CG    | REP 4F5KK1      |
| MS21153-6CE    | SREP 4F5KS181   |

| AS part number | SKF designation |
|----------------|-----------------|
| MS21153-6C     | REP 4F5KS181    |
| MS21153-7GE    | SREP 4FL5SK1    |
| MS21153-7G     | REP 4FL5SK1     |
| MS21153-7E     | SREP 4FL5S181   |
| MS21153-7      | REP 4FL5S181    |
| MS21153-7CGE   | SREP 4FL5KSK1   |
| MS21153-7CG    | REP 4FL5KK1     |
| MS21153-7CE    | SREP 4FL5KS181  |
| MS21153-7C     | REP 4FL5KS181   |
| MS21153-8GE    | SREP 4F7SK1     |
| MS21153-8G     | REP 4F7SK1      |
| MS21153-8E     | SREP 4F7S181    |
| MS21153-8      | REP 4F7S181     |
| MS21153-9GE    | SREP 4FL7SK1    |
| MS21153-9G     | REP 4FL7SK1     |
| MS21153-9E     | SREP 4FL7S181   |
| MS21153-9      | REP 4FL7S181    |
| MS21153-10GE   | SREP 5F5SK1     |
| MS21153-10G    | REP 5F5SK1      |
| MS21153-10E    | SREP 5F5S181    |
| MS21153-10     | REP 5F5S181     |
| MS21153-11GE   | SREP 5FL5SK1    |
| MS21153-11G    | REP 5FL5SK1     |
| MS21153-11E    | SREP 5FL5S181   |
| MS21153-11     | REP 5FL5S181    |

## Self-lubricating spherical plain bearing rod ends

## Metric bearings

| EN part number |             | SKF designation         |
|----------------|-------------|-------------------------|
| EN2498Ld'K     |             | EMAJdGRK <sup>1)</sup>  |
| EN2498Ld'T     |             | EMAJdGR <sup>1)</sup>   |
| EN2498Rd'K     |             | EMAJdRK <sup>1)</sup>   |
| EN2498Rd'T     |             | EMAJdR <sup>1)</sup>    |
| EN4198Ld'K     | EN4198Ld'KT | XEMAJdGRK <sup>1)</sup> |
| EN4198Ld'G     | EN4198Ld'GT | XEMAJdGR <sup>1)</sup>  |
| EN4198Rd'K     | EN4198Rd'KT | XEMAJdRK <sup>1)</sup>  |
| EN4198Rd'G     | EN4198Rd'GT | XEMAJdR <sup>1)</sup>   |

Where  
**d** = Bore code  
**d'** = d with a 0 replacing the space for bore code ≤ 8,  
d for bore code = 10  
<sup>1)</sup> Except for d = 8SP1A

**Example**

| EN part number |             | SKF designation |
|----------------|-------------|-----------------|
| EN2498L08K     |             | EMAJ 8GRK       |
| EN4198R10G     | EN4198R10GT | XEMAJ10R        |

## Inch bearings

| NSA part number                 |  | SKF designation      |
|---------------------------------|--|----------------------|
| NSA8143-dRK                     |  | RdMRK                |
| NSA8143-dR                      |  | RdMR                 |
| NSA8143-dLK                     |  | RdMLK                |
| NSA8143-dL                      |  | RdML                 |
| NSA 8149-dR (Except for d = 16) |  | RdFRCS <sup>1)</sup> |
| NSA 8149-dL (Except for d = 16) |  | RdFLCS <sup>1)</sup> |
| NSA 8149-16R                    |  | R16BFRCS             |
| NSA 8149-16L                    |  | R16BFLCS             |

Where  
**d** = Bore code  
<sup>1)</sup> Except for d = 16

**Example**

| EN part number |  | SKF designation |
|----------------|--|-----------------|
| NSA8143-03RK   |  | R03MRK          |
| NSA 8149-10L   |  | R10FLCS         |

| AS part number |  | SKF designation |
|----------------|--|-----------------|
| M81935/1-dCKL  |  | EMJ/WASdGK      |
| M81935/1-dCK   |  | EMJ/WASdK       |
| M81935/1-dCL   |  | EMJ/WASdG       |
| M81935/1-dC    |  | EMJ/WASd        |
| M81935/1-dKL   |  | MJ/WASdGK       |
| M81935/1-dK    |  | MJ/WASdK        |
| M81935/1-dL    |  | MJ/WASdG        |
| M81935/1-d     |  | MJ/WASd         |

Where  
**d** = Bore code (multiples of 1/16 inch)

**Example**

| AS part number |  | SKF designation |
|----------------|--|-----------------|
| M81935/1-03CKL |  | EMJ/WAS03GK     |
| M81935/1-10K   |  | MJ/WAS10K       |



| AS part number | AS designation |
|----------------|----------------|
| M81935/6-dCKL  | EPH MJ/WASdGK  |
| M81935/6-dCK   | EPH MJ/WASdK   |
| M81935/6-dCL   | EPH MJ/WASdG   |
| M81935/6-dC    | EPH MJ/WASd    |
| M81935/6-dKL   | PH MJ/WASdGK   |
| M81935/6-dK    | PH MJ/WASdK    |
| M81935/6-dL    | PH MJ/WASdG    |
| M81935/6-d     | PH MJ/WASd     |

Where

**d** = Bore code (multiples of 1/16 inch)**Example**

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/6-03CKL | EPH MJ/WAS03GK  |
| M81935/6-10K   | PH MJ/WAS10K    |

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/8-dCKL  | EPH MJ/NASdGK   |
| M81935/8-dCK   | EPH MJ/NASdK    |
| M81935/8-dCL   | EPH MJ/NASdG    |
| M81935/8-dC    | EPH MJ/NASd     |
| M81935/8-dKL   | PH MJ/NASdGK    |
| M81935/8-dK    | PH MJ/NASdK     |
| M81935/8-dL    | PH MJ/NASdG     |
| M81935/8-d     | PH MJ/NASd      |

Where

**d** = Bore code (multiples of 1/16 inch)**Example**

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/8-03CKL | EPH MJ/NAS03GK  |
| M81935/8-10K   | PH MJ/NAS10K    |

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/4-dCKL  | EMJ/NASdGK      |
| M81935/4-dCK   | EMJ/NASdK       |
| M81935/4-dCL   | EMJ/NASdG       |
| M81935/4-dC    | EMJ/NASd        |
| M81935/4-dKL   | MJ/NASdGK       |
| M81935/4-dK    | MJ/NASdK        |
| M81935/4-dL    | MJ/NASdG        |
| M81935/4-d     | MJ/NASd         |

Where

**d** = Bore code (multiples of 1/16 inch)**Example**

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/4-03CKL | EMJ/NAS03GK     |
| M81935/4-10K   | MJ/NAS10K       |

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/2-dCKL  | EFJ/WASdGK      |
| M81935/2-dCK   | EFJ/WASdK       |
| M81935/2-dCWL  | EFJ/WASdGW      |
| M81935/2-dCW   | EFJ/WASdW       |
| M81935/2-dCL   | EFJ/WASdG       |
| M81935/2-dC    | EFJ/WASd        |
| M81935/2-dKL   | FJ/WASdGK       |
| M81935/2-dK    | FJ/WASdK        |
| M81935/2-dWL   | FJ/WASdGW       |
| M81935/2-dW    | FJ/WASdW        |
| M81935/2-dL    | FJ/WASdG        |
| M81935/2-d     | FJ/WASd         |

Where

**d** = Bore code (multiples of 1/16 inch)**Example**

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/2-03CKL | EFJ/WAS03GK     |
| M81935/2-10W   | FJ/WAS10W       |

### 3 Self-lubricating spherical plain bearing rod end

3

| NSA part number | SKF designation |
|-----------------|-----------------|
| M81935/7-dCKL   | EPHFJ/WASdGK    |
| M81935/7-dCK    | EPHFJ/WASdK     |
| M81935/7-dCWL   | EPHFJ/WASdGW    |
| M81935/7-dCW    | EPHFJ/WASdW     |
| M81935/7-dCL    | EPHFJ/WASdG     |
| M81935/7-dC     | EPHFJ/WASd      |
| M81935/7-dKL    | PHFJ/WASdGK     |
| M81935/7-dK     | PHFJ/WASdK      |
| M81935/7-dWL    | PHFJ/WASdGW     |
| M81935/7-dW     | PHFJ/WASdW      |
| M81935/7-dL     | PHFJ/WASdG      |
| M81935/7-d      | PHFJ/WASd       |

Where

**d** = Bore code (multiples of 1/16 inch)

#### Example

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/7-03CKL | EPHFJ/WAS03GK   |
| M81935/7-10W   | PHFJ/WAS10W     |

| NSA part number | SKF designation |
|-----------------|-----------------|
| M81935/9-dCKL   | EPHFJ/NASdGK    |
| M81935/9-dCK    | EPHFJ/NASdK     |
| M81935/9-dCWL   | EPHFJ/NASdGW    |
| M81935/9-dCW    | EPHFJ/NASdW     |
| M81935/9-dCL    | EPHFJ/NASdG     |
| M81935/9-dC     | EPHFJ/NASd      |
| M81935/9-dKL    | PHFJ/NASdGK     |
| M81935/9-dK     | PHFJ/NASdK      |
| M81935/9-dWL    | PHFJ/NASdGW     |
| M81935/9-dW     | PHFJ/NASdW      |
| M81935/9-dL     | PHFJ/NASdG      |
| M81935/9-d      | PHFJ/NASd       |

Where

**d** = Bore code (multiples of 1/16 inch)

#### Example

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/9-03CKL | EPHFJ/NAS03GK   |
| M81935/9-10W   | PHFJ/NAS10W     |

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/5-dCKL  | EFJ/NASdGK      |
| M81935/5-dCK   | EFJ/NASdK       |
| M81935/5-dCWL  | EFJ/NASdGW      |
| M81935/5-dCW   | EFJ/NASdW       |
| M81935/5-dCL   | EFJ/NASdG       |
| M81935/5-dC    | EFJ/NASd        |
| M81935/5-dKL   | FJ/NASdGK       |
| M81935/5-dK    | FJ/NASdK        |
| M81935/5-dWL   | FJ/NASdGW       |
| M81935/5-dW    | FJ/NASdW        |
| M81935/5-dL    | FJ/NASdG        |
| M81935/5-d     | FJ/NASd         |

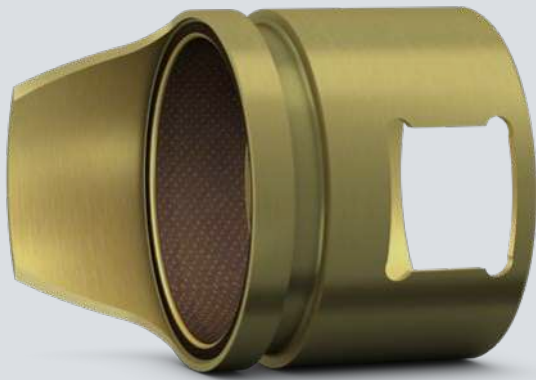
Where

**d** = Bore code (multiples of 1/16 inch)

#### Example

| AS part number | SKF designation |
|----------------|-----------------|
| M81935/5-03CKL | EFJ/NAS03GK     |
| M81935/5-10W   | FJ/NAS10W       |





4

## Self-lubricating journal bearings



# 4 Self-lubricating journal bearings

|                                              |            |                                                                         |            |
|----------------------------------------------|------------|-------------------------------------------------------------------------|------------|
| <b>Designs and variants</b> . . . . .        | <b>392</b> | <b>Product tables</b> . . . . .                                         | <b>404</b> |
| Shell materials . . . . .                    | 392        | Metric dimensions . . . . .                                             | 404        |
| Surface treatments . . . . .                 | 392        | <b>4.1</b> Plain bearings, EN 2285 and 2287 . . . . .                   | 404        |
| Liners . . . . .                             | 392        | <b>4.2</b> Plain bearings, . . . . .                                    | 406        |
| Customized bearings . . . . .                | 392        | <b>4.3</b> Flanged bearings, EN 2286 and EN 2288 . . . . .              | 408        |
| <b>Bearing selection process</b> . . . . .   | <b>394</b> | <b>4.4</b> Flanged bearings . . . . .                                   | 410        |
| Selecting bearing size and options . . . . . | 394        | Inch dimensions . . . . .                                               | 412        |
| Load carrying capability . . . . .           | 394        | <b>4.5</b> Plain bearings, NSA 8145, NSA 8146 . . . . .                 | 412        |
| Static load limits . . . . .                 | 394        | <b>4.6</b> Plain bearings, AS 81934/1 . . . . .                         | 414        |
| Dynamic load rating . . . . .                | 394        | <b>4.7</b> Plain bearings, EN 4534-2 and EN 4536-2 . . . . .            | 416        |
| Bearing life . . . . .                       | 394        | <b>4.8</b> Flanged bearings, NSA 8147, NSA 8148 . . . . .               | 418        |
| Friction and torque . . . . .                | 394        | <b>4.9</b> Flanged bearings, AS 81934/2 . . . . .                       | 420        |
| Operating temperature . . . . .              | 394        | <b>4.10</b> Flanged bearings, EN 4535-2 and EN 4537-2, code U . . . . . | 422        |
| Selecting fit . . . . .                      | 396        | <b>Cross-reference</b> . . . . .                                        | <b>426</b> |
| Fits and tolerances . . . . .                | 396        | Metric bearings . . . . .                                               | 426        |
| Counterface surfaces . . . . .               | 396        | Inch bearings . . . . .                                                 | 426        |
| Metric bearings . . . . .                    | 397        |                                                                         |            |
| Inch bearings . . . . .                      | 398        |                                                                         |            |
| Bearing data . . . . .                       | 401        |                                                                         |            |
| Material . . . . .                           | 401        |                                                                         |            |
| Surface treatments . . . . .                 | 401        |                                                                         |            |
| <b>Bearing handling</b> . . . . .            | <b>402</b> |                                                                         |            |
| Lubrication . . . . .                        | 402        |                                                                         |            |
| Mounting . . . . .                           | 402        |                                                                         |            |
| Interference fit . . . . .                   | 402        |                                                                         |            |
| Retaining compound . . . . .                 | 402        |                                                                         |            |
| Dismounting . . . . .                        | 402        |                                                                         |            |
| Storage . . . . .                            | 402        |                                                                         |            |
| <b>Customized products</b> . . . . .         | <b>403</b> |                                                                         |            |
| Legacy products . . . . .                    | 403        |                                                                         |            |
| Legacy standards . . . . .                   | 403        |                                                                         |            |
| Customer standards . . . . .                 | 403        |                                                                         |            |

# 4 Self-lubricating journal bearings

Journal bearings enable low friction rotation and/or axial sliding of a shaft. They provide a lubricated and wear-resistant surface and enable stable positioning of the guided shaft. If wear in the journal bearing reaches specification limits, the bearing can be replaced without requiring replacement of the surrounding housing structure.

Self-lubricating journal bearings are "maintenance-free" and can accommodate some misalignment between the housing and the shaft. They also prevent fretting between mating parts.

Flanged journal bearings are typically used when axial load carrying capability is needed.

Self-lubricating journal bearings are used widely in aircraft structures. They can be found in many applications including:

- Landing gears
- Flight controls
- Actuators, attachment points and hinges
- Doors
- Helicopter rotors

## Designs and variants

The standard assortment of SKF self-lubricating journal bearings is comprised of:

- Plain and flanged bearings
- Two shell materials: corrosion-resistant steel and aluminium alloy
- Two liner types based on reinforced PTFE composites
- A wide range of bore diameters and lengths

SKF manufactures journal bearings complying with international and customer-specific standards. Available product ranges are provided in **table 1** for metric bearings and in **table 2** for inch bearings.

## Shell materials

Standard shell materials are:

- corrosion-resistant steel for high load carrying capacity and elevated operating temperatures
- aluminium alloy for lightweight solutions

SKF also supplies customized journal bearings using various other material types and grades, e.g. titanium, 15–5 PH.

For more information and options, refer to *Shell* **page 401**.

## Surface treatments

Surface treatments are used to adapt to various application requirements, providing:

- Enhanced corrosion resistance
- Reduced fretting damage

SKF standard surface treatments are passivation for steel and sulfuric acid anodizing for aluminium alloy. For more information and options, refer to *Surface treatments* **page 401**.

## Liners

The standard liner types are X1 and Fiberslip:

- X1 demonstrates superior wear characteristics in the majority of applications.
- Fiberslip is more suitable for sliding against softer counterfaces.

In addition, the Textilub liner type is an available customized option for improved performance in specific applications.

For more information, refer to *Liners* **page 401**.

## Customized bearings

SKF supplies customized journal bearings to meet specific application requirements. These solutions are the result of SKF's extensive experience and close cooperation between SKF and the customer's application experts. SKF provides total solutions over the full bearing life cycle, including design, testing and partnership.

For more information, refer to *Customized products* **page 403**.

Contact your regional SKF Aerospace partner at: [skf.com/go/aero](https://skf.com/go/aero)

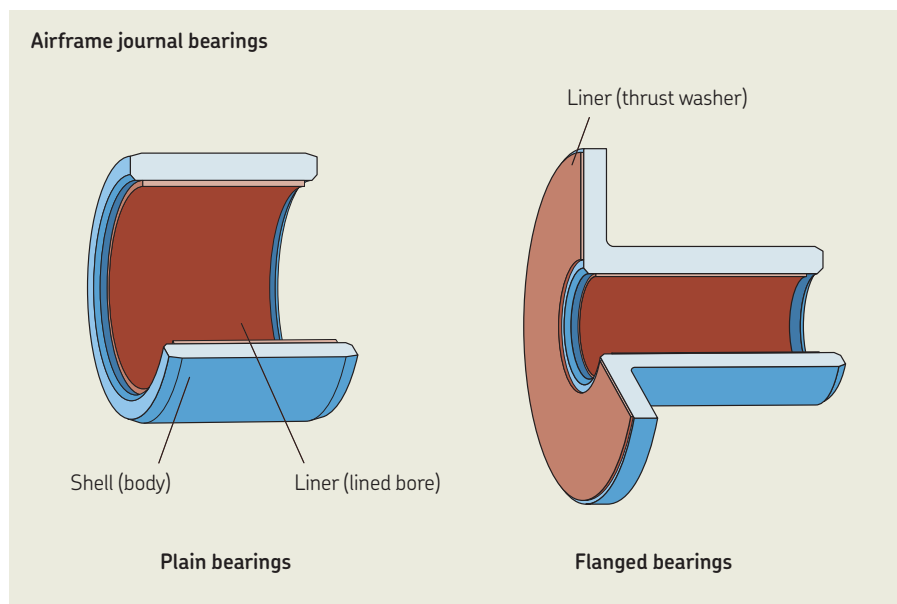


Table 1

## SKF self-lubricating journal bearings (metric dimensions)

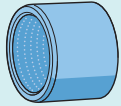
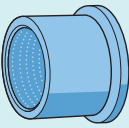
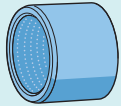
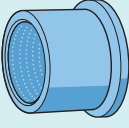
| Shape                                                                                        | Shell material            | Standard | Liner     | SKF series | Table number | Page |
|----------------------------------------------------------------------------------------------|---------------------------|----------|-----------|------------|--------------|------|
| Plain<br>   | Corrosion-resistant steel | EN 2287  | X1        | 13C..Z     | 4.1          | 404  |
|                                                                                              |                           | EN 2287  | Fiberslip | ..K        | 4.1          | 404  |
|                                                                                              |                           | –        | X1        | 13D..Z     | 4.2          | 406  |
|                                                                                              | Aluminium alloy           | EN 2285  | X1        | 13C..Z     | 4.1          | 404  |
|                                                                                              |                           | EN 2285  | Fiberslip | ..K        | 4.1          | 404  |
|                                                                                              |                           | –        | X1        | 13D..Z     | 4.2          | 406  |
| Flanged<br> | Corrosion-resistant steel | EN 2288  | X1        | 13C..F     | 4.3          | 408  |
|                                                                                              |                           | EN 2288  | Fiberslip | ..F..K     | 4.3          | 408  |
|                                                                                              |                           | –        | X1        | 13D..F     | 4.4          | 410  |
|                                                                                              | Aluminium alloy           | EN 2286  | X1        | 13C..F     | 4.3          | 408  |
|                                                                                              |                           | EN 2286  | Fiberslip | ..F..K     | 4.3          | 408  |
|                                                                                              |                           | –        | X1        | 13D..F     | 4.4          | 410  |

Table 2

## SKF self-lubricating journal bearings (inch dimensions)

| Shape                                                                                          | Shell material            | Standard   | Liner     | SKF series | Table number | Page |
|------------------------------------------------------------------------------------------------|---------------------------|------------|-----------|------------|--------------|------|
| Plain<br>   | Corrosion-resistant steel | NSA 8145   | X1        | 13A..Z..   | 4.5          | 412  |
|                                                                                                |                           | NSA 8145   | Fiberslip | K..P       | 4.5          | 412  |
|                                                                                                |                           | AS 81934/1 | X1        | 13B..Z..   | 4.6          | 414  |
|                                                                                                |                           | EN 4536-2  | X1        | 13E..Z..   | 4.7          | 416  |
|                                                                                                | Aluminium alloy           | NSA 8146   | X1        | 13A..Z..   | 4.5          | 412  |
|                                                                                                |                           | NSA 8146   | Fiberslip | K..P       | 4.5          | 412  |
|                                                                                                |                           | AS 81934/1 | X1        | 13B..Z..   | 4.6          | 414  |
|                                                                                                |                           | EN 4534-2  | X1        | 13E..Z..   | 4.7          | 416  |
| Flanged<br> | Corrosion-resistant steel | NSA 8147   | X1        | 13A..Z..   | 4.8          | 418  |
|                                                                                                |                           | NSA 8147   | Fiberslip | K..F..P    | 4.8          | 418  |
|                                                                                                |                           | AS 81934/2 | X1        | 13B..F..   | 4.9          | 420  |
|                                                                                                |                           | EN 4537-2  | X1        | 13E..F..   | 4.10         | 422  |
|                                                                                                | Aluminium alloy           | NSA 8148   | X1        | 13A..F..   | 4.8          | 418  |
|                                                                                                |                           | NSA 8148   | Fiberslip | K..F..P    | 4.8          | 418  |
|                                                                                                |                           | AS 81934/2 | X1        | 13B..F..   | 4.9          | 420  |
|                                                                                                |                           | EN 4535-2  | X1        | 13E..F..   | 4.10         | 422  |

# Bearing selection process

## Selecting bearing size and options

If you are looking for a known self-lubricating journal bearing, according to its standard for example, or if you are an experienced bearing expert, use **table 1** and **2** to find the relevant product table.

For help in selecting the appropriate self-lubricating journal bearing size and options, follow these steps:

4

- 1 Determine the range of allowable inter-face dimensions. Often the boundary dimensions of a bearing are predetermined by the space available on the aircraft system. Typically, the shaft diameter determines the bearing bore diameter.

Determine the radial and axial load requirements. Refer to *Load carrying capability* **page 394**.

- 2 From the product tables (**pages 404 to 425**), find a bearing in an appropriate material with sufficient load carrying capability which best fits the required dimensions

### Example

For a plain bearing with a length of 18 mm, to be mounted on a shaft of minimum 20 mm diameter, and into a housing of maximum 26 mm bore diameter, operating under a radial static load of 10 kN, 13D2018AZ aluminium alloy bearing can be selected.

- 3 Choose all other required options, including surface treatments (**page 401**), and refer to fits and counterface recommendations (**page 396**).

If the standard SKF range of self-lubricating journal bearings does not meet your specific needs, contact SKF for a customized design solution, as described in *Customized products* **page 403**.

## Load carrying capability

To calculate the load limits of SKF self-lubricating journal bearings, use the formulae provided in **table 3** for metric bearings and **table 4** for inch bearings.

SKF bearings are compliant to AS 81934, AS 81820 and EN 2755. They meet the

requirements of static load, deflection and permanent set, and all dynamic wear limits. For more information about SKF liners including dynamic test performance, refer to *Spherical plain bearings – Load carrying capability* **page 144**. For operating conditions beyond the tested parameters, contact your regional SKF Aerospace partner at: [skf.com/go/aero](http://skf.com/go/aero)

## Static load limits

The compressive strengths of SKF liners are higher than the yield stress of the standard shell materials. Therefore, the static load limit is determined by the yield stress of the shell material.

## Dynamic load rating

The radial dynamic load rating, as specified by AS 81934, is the load that a journal bearing can withstand under the following conditions:

- oscillating movement of 25 000 cycles
- oscillating speed  $\geq 10$  cpm
- wear  $\leq 0,114$  mm (0.0045 in)

## Bearing life

Bearing life mainly depends on application loads (liner pressure), speed (sliding velocity), and counterface characteristics. Operating temperature and liquid or solid contamination are also important factors for bearing life. For a preliminary check of bearing size in relation to liner pressure and sliding velocity, refer to *Spherical plain bearing – Load carrying capability* **page 144**.

For a bearing life analysis considering relevant parameters, or for customized solutions for individual application requirements, contact your regional SKF Aerospace partner at: [skf.com/go/aero](http://skf.com/go/aero)

## Friction and torque

The friction in self-lubricating journal bearings is determined by the liner and its mating surface under application conditions. For information about the frictional properties of liner materials, refer to *Spherical plain bearings – Friction and torque* **page 146**.

## Operating temperature

SKF self-lubricating journal bearings are designed to meet the full temperature requirements of typical aeronautical applications. Their operating temperature is dictated by the temperature limits of the shell material and liner system.

Liner systems can be used at operating temperatures between  $-55$  and  $+200$  °C ( $-67$  to  $+390$  °F). Immersion into liquid nitrogen at  $-193$  °C ( $-315$  °F) for freeze fitting has no detrimental effect on the liner. For aluminium shell material, the maximum operating temperature is limited to  $+120$  °C ( $+250$  °F).

When evaluating the suitability of self-lubricating journal bearings for various operating temperatures, the following aspects should be considered:

- Temperature dependent properties of the shell material, refer to *Shell material* **page 401**
- Duration of exposure to the temperature
- Actual load and sliding velocity when exposed to a certain temperature
- Required bearing life

For more information about liner temperature properties, refer to *Spherical plain bearings – Operating temperature* **page 147**.



Table 3

## Static load limits and dynamic load ratings, metric values

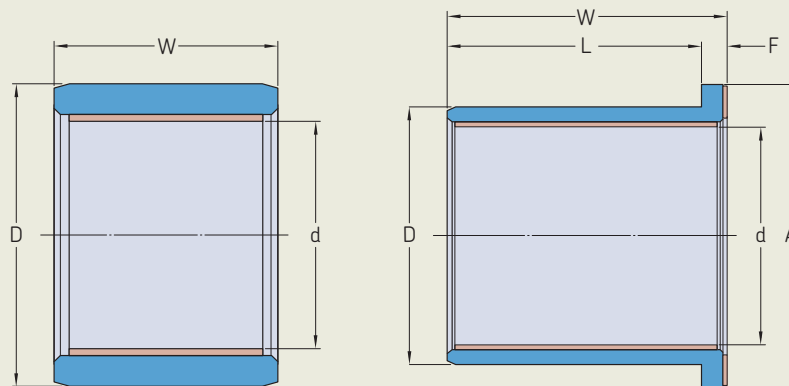
| mm, N and MPa  | Radial static load limit                               | Axial static load limit                                        | Radial dynamic load rating |
|----------------|--------------------------------------------------------|----------------------------------------------------------------|----------------------------|
| <b>Plain</b>   | $C_s = \frac{3}{4} \sigma_{\text{yield}} d (W - 2,5)$  | –                                                              | $C = 260 d (W - 2,5)$      |
| <b>Flanged</b> | $C_s = \frac{3}{4} \sigma_{\text{yield}} d (L - 1,75)$ | $C_a = 0,47 \sigma_{\text{yield}} ((A - 1,5)^2 - (d + 2,5)^2)$ | $C = 260 d (L - 1,75)$     |

Table 4

## Static load limits and dynamic load ratings, inch values

| in, lbf and psi | Radial static load limit                               | Axial static load limit                                         | Radial dynamic load rating |
|-----------------|--------------------------------------------------------|-----------------------------------------------------------------|----------------------------|
| <b>Plain</b>    | $C_s = \frac{3}{4} \sigma_{\text{yield}} d (W - 0,1)$  | –                                                               | $C = 37\,500 d (W - 0,1)$  |
| <b>Flanged</b>  | $C_s = \frac{3}{4} \sigma_{\text{yield}} d (L - 0,07)$ | $C_a = 0,47 \sigma_{\text{yield}} ((A - 0,06)^2 - (d + 0,1)^2)$ | $C = 37\,500 d (L - 0,07)$ |

## Bearing dimensions and symbols



## Where:

- A Flange diameter [mm/in]  
 L Length to back face of flange [mm/in]  
 ( $L = W - F$  [mm/in])  
 d Bore diameter [mm/in]  
 F Flange width [mm/in]  
 D Outer diameter [mm/in]  
 W Overall width [mm/in]

- $C_a$  Axial static load limit [N/lbf]  
 $C_s$  Radial static load limit [N/lbf]  
 C Radial dynamic load rating [N/lbf]  
 $\sigma_{\text{yield}}$  Yield stress of shell material [MPa/psi]  
 (table 5)

Table 5

## Yield stresses of shell material

| Material         | Yield stress<br>$\sigma_{\text{yield}}$ |         |
|------------------|-----------------------------------------|---------|
|                  | MPa                                     | psi     |
| 17-4PH H1150     | 724                                     | 105 000 |
| S.80 (FHT)       | 690                                     | 100 050 |
| 2618 DTD 5014 TF | 340                                     | 49 300  |
| 2024 T851        | 400                                     | 58 000  |
| 2024 T8511       | 400                                     | 58 000  |

### Selecting fit

To use the full load carrying capability of a bearing, it must be fully supported by the shaft and the housing.

### Fits and tolerances

Journal bearings are typically interference fitted into their housing or a retaining compound can be used between the journal bearing and housing to maintain the bearing in position. When interference fitted, the installed lined bore size is reduced accordingly. Suitable housing and shaft diameter ranges are provided in **tables 6 to 9, pages 397 to 400**.

4

### Counterface surfaces

It is recommended to use a hard surface as a counterface to the liner. Typical solutions are listed below. For softer counterfaces Fiberslip liner should be used. See also NOTE regarding very soft surfaces.

#### Steel

Hardened steel is the preferred counterface material for the standard self-lubricating journal bearing liners. It is recommended that steel shaft surfaces comply to the following specifications:

- Surface roughness  $Ra \leq 0,1 \mu m$  ( $4 \mu in.$ )
- Hardness  $\geq 56$  HRC

Softer steel counterfaces can be used but with implications on the liner wear rate. A suitable coating can be applied to achieve the required hardness. Refer to *Customized products* **page 403** and contact SKF.

#### Aluminium alloy

Aluminium alloy counterface surfaces should be hard anodized. Using aluminium instead of steel can reduce bearing life.

#### Titanium alloy

Titanium alloy counterface surfaces should have a hard surface treatment applied to provide suitable surface properties. Hard chromium plating or similar coating can provide suitable surface properties.

**NOTE:** Very soft surfaces such as paint films, dry-film lubricants, cadmium or zinc-nickel plating are not suitable as counterface surfaces for the self-lubricating journal bearing liners.

## Metric bearings

Table 6

## Housing and shaft tolerances by type of fit

Series: ..K, 13C..Z  
 13D..Z  
 ..F..K, 13C..F  
 13D..F

| Interference fit in housing |                  |        |                |        |           |        | Adhesive bonding to housing |                  |        |                |        |           |        |
|-----------------------------|------------------|--------|----------------|--------|-----------|--------|-----------------------------|------------------|--------|----------------|--------|-----------|--------|
| Nominal bore Code           | Housing diameter |        | Shaft diameter |        |           |        | Nominal bore Code           | Housing diameter |        | Shaft diameter |        |           |        |
|                             | Upper            | Lower  | Transition fit |        | Loose fit |        |                             | Upper            | Lower  | Transition fit |        | Loose fit |        |
| –                           | mm               |        | mm             |        |           |        | –                           | mm               |        | mm             |        |           |        |
| 06                          | 10,015           | 10,000 | 6,007          | 5,999  | 5,990     | 5,982  | 06                          | 10,124           | 10,074 | 6,024          | 6,016  | 6,004     | 5,996  |
| 08                          | 12,018           | 12,000 | 8,007          | 7,998  | 7,987     | 7,978  | 08                          | 12,129           | 12,079 | 8,025          | 8,016  | 8,005     | 7,996  |
| 10                          | 14,018           | 14,000 | 10,007         | 9,998  | 9,987     | 9,978  | 10                          | 14,129           | 14,079 | 10,025         | 10,016 | 10,005    | 9,996  |
| 12                          | 16,018           | 16,000 | 12,008         | 11,997 | 11,984    | 11,973 | 12                          | 16,129           | 16,079 | 12,026         | 12,015 | 12,006    | 11,995 |
| 15                          | 19,021           | 19,000 | 15,008         | 14,997 | 14,984    | 14,973 | 15                          | 19,135           | 19,085 | 15,026         | 15,015 | 15,006    | 14,995 |
| 16                          | 20,021           | 20,000 | 16,008         | 15,997 | 15,984    | 15,973 | 16                          | 20,135           | 20,085 | 16,026         | 16,015 | 16,006    | 15,995 |
| 18                          | 22,021           | 22,000 | 18,008         | 17,997 | 17,984    | 17,973 | 18                          | 22,135           | 22,085 | 18,026         | 18,015 | 18,006    | 17,995 |
| 20                          | 25,021           | 25,000 | 20,009         | 19,996 | 19,980    | 19,967 | 20                          | 25,135           | 25,085 | 20,027         | 20,014 | 20,007    | 19,994 |
| 22                          | 26,021           | 26,000 | 22,009         | 21,996 | 21,980    | 21,967 | 22                          | 26,135           | 26,085 | 22,027         | 22,014 | 22,007    | 21,994 |
| 25                          | 30,021           | 30,000 | 25,009         | 24,996 | 24,980    | 24,967 | 25                          | 30,135           | 30,085 | 25,027         | 25,014 | 25,007    | 24,994 |
| 28                          | 34,025           | 34,000 | 28,009         | 27,996 | 27,980    | 27,967 | 28                          | 34,142           | 34,092 | 28,027         | 28,014 | 28,007    | 27,994 |
| 30                          | 36,025           | 36,000 | 30,009         | 29,996 | 29,980    | 29,967 | 30                          | 36,142           | 36,092 | 30,027         | 30,014 | 30,007    | 29,994 |
| 32                          | 38,025           | 38,000 | 32,011         | 31,995 | 31,975    | 31,959 | 32                          | 38,142           | 38,092 | 32,029         | 32,013 | 32,009    | 31,993 |
| 35                          | 42,025           | 42,000 | 35,011         | 34,995 | 34,975    | 34,959 | 35                          | 42,142           | 42,092 | 35,029         | 35,013 | 35,009    | 34,993 |
| 40                          | 48,025           | 48,000 | 40,011         | 39,995 | 39,975    | 39,959 | 40                          | 48,142           | 48,092 | 40,029         | 40,013 | 40,009    | 39,993 |
| 45                          | 52,030           | 52,000 | 45,011         | 44,995 | 44,975    | 44,959 | 45                          | 52,151           | 52,101 | 45,029         | 45,013 | 45,009    | 44,993 |
| 50                          | 58,030           | 58,000 | 50,011         | 49,995 | 49,975    | 49,959 | 50                          | 58,151           | 58,101 | 50,029         | 50,013 | 50,009    | 49,993 |

## Inch bearings

Table 7

## Housing and shaft tolerances by type of fit

Series: K..P  
K..F..P  
13A..F..  
13A..Z..

## Interference fit in housing

| Nominal bore | Size            | Housing diameter |                  | Shaft diameter   |                  |                  |                  |
|--------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
|              |                 |                  |                  | Transition fit   |                  | Loose fit        |                  |
|              |                 | Upper            | Lower            | Upper            | Lower            | Upper            | Lower            |
| Code         | in/mm           | in/mm            |                  | in/mm            |                  |                  |                  |
| –            | –               | –                | –                | –                | –                | –                | –                |
| 04           | 1/4<br>6,350    | 0.3754<br>9,535  | 0.3750<br>9,525  | 0.2500<br>6,350  | 0.2496<br>6,340  | 0.2495<br>6,337  | 0.2491<br>6,327  |
| 05           | 5/16<br>7,938   | 0.4380<br>11,125 | 0.4375<br>11,113 | 0.3125<br>7,938  | 0.3121<br>7,927  | 0.3120<br>7,925  | 0.3116<br>7,915  |
| 06           | 3/8<br>9,525    | 0.5005<br>12,713 | 0.5000<br>12,700 | 0.3750<br>9,525  | 0.3746<br>9,515  | 0.3745<br>9,512  | 0.3741<br>9,502  |
| 08           | 1/2<br>12,700   | 0.6882<br>17,480 | 0.6875<br>17,463 | 0.5000<br>12,700 | 0.4996<br>12,690 | 0.4994<br>12,685 | 0.4990<br>12,675 |
| 10           | 5/8<br>15,875   | 0.8133<br>20,658 | 0.8125<br>20,638 | 0.6250<br>15,875 | 0.6246<br>15,865 | 0.6244<br>15,860 | 0.6240<br>15,850 |
| 12           | 3/4<br>19,050   | 0.9383<br>23,833 | 0.9375<br>23,813 | 0.7500<br>19,050 | 0.7495<br>19,037 | 0.7492<br>19,030 | 0.7487<br>19,017 |
| 14           | 7/8<br>19,050   | 1.0633<br>27,008 | 1.0625<br>26,988 | 0.8750<br>22,225 | 0.8745<br>22,212 | 0.8742<br>22,205 | 0.8737<br>22,192 |
| 16           | 1<br>25,400     | 1.1883<br>30,183 | 1.1875<br>30,163 | 1.0000<br>25,400 | 0.9995<br>25,387 | 0.9992<br>25,380 | 0.9987<br>25,367 |
| 18           | 1 1/8<br>28,575 | 1.3135<br>33,363 | 1.3125<br>33,338 | 1.1250<br>28,575 | 1.1245<br>28,562 | 1.1242<br>28,555 | 1.1237<br>28,542 |
| 20           | 1 1/4<br>31,750 | 1.5010<br>38,125 | 1.5000<br>38,100 | 1.2500<br>31,750 | 1.2494<br>31,735 | 1.2490<br>31,725 | 1.2484<br>31,709 |
| 22           | 1 3/8<br>34,925 | 1.6260<br>41,300 | 1.6250<br>41,275 | 1.3750<br>34,925 | 1.3744<br>34,910 | 1.3740<br>34,900 | 1.3734<br>34,884 |
| 24           | 1 1/2<br>38,100 | 1.7510<br>44,475 | 1.7500<br>44,450 | 1.5000<br>38,100 | 1.4994<br>38,085 | 1.4990<br>38,075 | 1.4984<br>38,059 |
| 28           | 1 3/4<br>44,450 | 2.0012<br>50,830 | 2.0000<br>50,800 | 1.7500<br>44,450 | 1.7494<br>44,435 | 1.7490<br>44,425 | 1.7484<br>44,409 |
| 32           | 2<br>50,800     | 2.2512<br>57,180 | 2.2500<br>57,150 | 2.0000<br>50,800 | 1.9993<br>50,782 | 1.9988<br>50,770 | 1.9981<br>50,752 |

## Adhesive bonding to housing

| Nominal bore | Size            | Housing diameter |                  | Shaft diameter   |                  |                  |                  |
|--------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
|              |                 |                  |                  | Transition fit   |                  | Loose fit        |                  |
|              |                 | Upper            | Lower            | Upper            | Lower            | Upper            | Lower            |
| Code         | in/mm           | in/mm            |                  | in/mm            |                  |                  |                  |
| –            | –               | –                | –                | –                | –                | –                | –                |
| 04           | 1/4<br>6,350    | 0.3800<br>9,652  | 0.3780<br>9,601  | 0.2511<br>6,378  | 0.2507<br>6,368  | 0.2503<br>6,358  | 0.2499<br>6,347  |
| 05           | 5/16<br>7,938   | 0.4426<br>11,242 | 0.4406<br>11,191 | 0.3138<br>7,971  | 0.3134<br>7,960  | 0.3130<br>7,950  | 0.3126<br>7,940  |
| 06           | 3/8<br>9,525    | 0.5051<br>12,830 | 0.5031<br>12,779 | 0.3764<br>9,561  | 0.3760<br>9,550  | 0.3756<br>9,540  | 0.3752<br>9,530  |
| 08           | 1/2<br>12,700   | 0.6928<br>17,597 | 0.6908<br>17,546 | 0.5014<br>12,736 | 0.5010<br>12,725 | 0.5006<br>12,715 | 0.5002<br>12,705 |
| 10           | 5/8<br>15,875   | 0.8179<br>20,775 | 0.8159<br>20,724 | 0.6265<br>15,913 | 0.6261<br>15,903 | 0.6257<br>15,893 | 0.6253<br>15,883 |
| 12           | 3/4<br>19,050   | 0.9429<br>23,950 | 0.9409<br>23,899 | 0.7516<br>19,091 | 0.7511<br>19,078 | 0.7508<br>19,070 | 0.7503<br>19,058 |
| 14           | 7/8<br>19,050   | 1.0680<br>27,127 | 1.0660<br>27,076 | 0.8767<br>22,268 | 0.8762<br>22,255 | 0.8759<br>22,248 | 0.8754<br>22,235 |
| 16           | 1<br>25,400     | 1.1930<br>30,302 | 1.1910<br>30,251 | 1.0018<br>25,446 | 1.0013<br>25,433 | 1.0010<br>25,425 | 1.0005<br>25,413 |
| 18           | 1 1/8<br>28,575 | 1.3183<br>33,485 | 1.3163<br>33,434 | 1.1271<br>28,628 | 1.1266<br>28,616 | 1.1263<br>28,608 | 1.1258<br>28,595 |
| 20           | 1 1/4<br>31,750 | 1.5059<br>38,250 | 1.5039<br>38,199 | 1.2520<br>31,801 | 1.2514<br>31,786 | 1.2512<br>31,780 | 1.2506<br>31,765 |
| 22           | 1 3/8<br>34,925 | 1.6309<br>41,425 | 1.6289<br>41,374 | 1.3771<br>34,978 | 1.3765<br>34,963 | 1.3763<br>34,958 | 1.3757<br>34,943 |
| 24           | 1 1/2<br>38,100 | 1.7539<br>44,549 | 1.7519<br>44,498 | 1.5021<br>38,153 | 1.5015<br>38,138 | 1.5013<br>38,133 | 1.5007<br>38,118 |
| 28           | 1 3/4<br>44,450 | 2.0063<br>50,960 | 2.0043<br>50,909 | 1.7525<br>44,514 | 1.7519<br>44,498 | 1.7517<br>44,493 | 1.7511<br>44,478 |
| 32           | 2<br>50,800     | 2.2563<br>57,310 | 2.2543<br>57,259 | 2.0025<br>50,864 | 2.0018<br>50,846 | 2.0017<br>50,843 | 2.0010<br>50,825 |

Table 8

## Housing and shaft tolerances by type of fit

Material : Aluminium alloy  
 Series: 13B..Z..  
 13B..F..  
 13E..F..

| Interference fit in housing |        |                  |        |                |        |           |        | Adhesive bonding to housing |        |                  |                |                |           |        |       |
|-----------------------------|--------|------------------|--------|----------------|--------|-----------|--------|-----------------------------|--------|------------------|----------------|----------------|-----------|--------|-------|
| Nominal bore                |        | Housing diameter |        | Shaft diameter |        |           |        | Nominal bore                |        | Housing diameter |                | Shaft diameter |           |        |       |
| Code                        | Size   |                  |        | Transition fit |        | Loose fit |        | Code                        |        |                  | Transition fit |                | Loose fit |        |       |
|                             |        | Upper            | Lower  | Upper          | Lower  | Upper     | Lower  |                             |        | Upper            | Lower          | Upper          | Lower     | Upper  | Lower |
| –                           | in/mm  | in/mm            |        | in/mm          |        |           |        | –                           | in/mm  |                  |                | in/mm          |           |        |       |
| 04                          | 1/4    | 0.3754           | 0.3750 | 0.2495         | 0.2490 | 0.2489    | 0.2484 | 04                          | 0.3800 | 0.3780           | 0.2513         | 0.2508         | 0.2505    | 0.2500 |       |
|                             | 6,350  | 9,535            | 9,525  | 6,337          | 6,325  | 6,322     | 6,309  |                             | 9,652  | 9,601            | 6,383          | 6,370          | 6,363     | 6,350  |       |
| 05                          | 5/16   | 0.4380           | 0.4375 | 0.3120         | 0.3115 | 0.3114    | 0.3109 | 05                          | 0.4426 | 0.4406           | 0.3138         | 0.3133         | 0.3130    | 0.3125 |       |
|                             | 7,938  | 11,125           | 11,113 | 7,925          | 7,912  | 7,910     | 7,897  |                             | 11,242 | 11,191           | 7,971          | 7,958          | 7,950     | 7,938  |       |
| 06                          | 3/8    | 0.5005           | 0.5000 | 0.3745         | 0.3740 | 0.3739    | 0.3734 | 06                          | 0.5051 | 0.5031           | 0.3763         | 0.3758         | 0.3755    | 0.3750 |       |
|                             | 9,525  | 12,713           | 12,700 | 9,512          | 9,500  | 9,497     | 9,484  |                             | 12,830 | 12,779           | 9,558          | 9,545          | 9,538     | 9,525  |       |
| 07                          | 7/16   | 0.5631           | 0.5624 | 0.4365         | 0.4360 | 0.4358    | 0.4353 | 07                          | 0.5677 | 0.5657           | 0.4388         | 0.4383         | 0.4380    | 0.4375 |       |
|                             | 11,113 | 14,303           | 14,285 | 11,087         | 11,074 | 11,069    | 11,057 |                             | 14,420 | 14,369           | 11,146         | 11,133         | 11,125    | 11,113 |       |
| 08                          | 1/2    | 0.6258           | 0.6251 | 0.4990         | 0.4985 | 0.4983    | 0.4978 | 08                          | 0.6305 | 0.6285           | 0.5013         | 0.5008         | 0.5005    | 0.5000 |       |
|                             | 12,700 | 15,895           | 15,878 | 12,675         | 12,662 | 12,657    | 12,644 |                             | 16,015 | 15,964           | 12,733         | 12,720         | 12,713    | 12,700 |       |
| 09                          | 9/16   | 0.6885           | 0.6878 | 0.5615         | 0.5610 | 0.5608    | 0.5603 | 09                          | 0.6932 | 0.6912           | 0.5638         | 0.5633         | 0.5630    | 0.5625 |       |
|                             | 14,288 | 17,488           | 17,470 | 14,262         | 14,249 | 14,244    | 14,232 |                             | 17,607 | 17,556           | 14,321         | 14,308         | 14,300    | 14,288 |       |
| 10                          | 5/8    | 0.8135           | 0.8127 | 0.6240         | 0.6235 | 0.6233    | 0.6228 | 10                          | 0.8181 | 0.8161           | 0.6263         | 0.6258         | 0.6255    | 0.6250 |       |
|                             | 15,875 | 20,663           | 20,643 | 15,850         | 15,837 | 15,832    | 15,819 |                             | 20,780 | 20,729           | 15,908         | 15,895         | 15,888    | 15,875 |       |
| 11                          | 1 1/16 | 0.8760           | 0.8752 | 0.6865         | 0.6860 | 0.6858    | 0.6853 | 11                          | 0.8806 | 0.8786           | 0.6888         | 0.6883         | 0.6880    | 0.6875 |       |
|                             | 26,988 | 22,250           | 22,230 | 17,437         | 17,424 | 17,419    | 17,407 |                             | 22,367 | 22,316           | 17,496         | 17,483         | 17,475    | 17,463 |       |
| 12                          | 3/4    | 0.9386           | 0.9378 | 0.7490         | 0.7485 | 0.7482    | 0.7478 | 12                          | 0.9432 | 0.9412           | 0.7513         | 0.7508         | 0.7505    | 0.7500 |       |
|                             | 19,050 | 23,840           | 23,820 | 19,025         | 19,012 | 19,004    | 18,994 |                             | 23,957 | 23,906           | 19,083         | 19,070         | 19,063    | 19,050 |       |
| 14                          | 7/8    | 1.0638           | 1.0630 | 0.8740         | 0.8735 | 0.8732    | 0.8727 | 14                          | 1.0684 | 1.0664           | 0.8763         | 0.8758         | 0.8755    | 0.8750 |       |
|                             | 22,225 | 27,021           | 27,000 | 22,200         | 22,187 | 22,179    | 22,167 |                             | 27,137 | 27,087           | 22,258         | 22,245         | 22,238    | 22,225 |       |
| 16                          | 1      | 1.1891           | 1.1883 | 0.9990         | 0.9985 | 0.9982    | 0.9978 | 16                          | 1.1938 | 1.1918           | 1.0013         | 1.0008         | 1.0005    | 1.0000 |       |
|                             | 25,400 | 30,203           | 30,183 | 25,375         | 25,362 | 25,354    | 25,344 |                             | 30,323 | 30,272           | 25,433         | 25,420         | 25,413    | 25,400 |       |
| 18                          | 1 1/8  | 1.3141           | 1.3131 | 1.1240         | 1.1235 | 1.1232    | 1.1227 | 18                          | 1.3189 | 1.3169           | 1.1263         | 1.1258         | 1.1255    | 1.1250 |       |
|                             | 28,575 | 33,378           | 33,353 | 28,550         | 28,537 | 28,529    | 28,517 |                             | 33,500 | 33,449           | 28,608         | 28,595         | 28,588    | 28,575 |       |
| 20                          | 1 1/4  | 1.4390           | 1.4380 | 1.2490         | 1.2484 | 1.2480    | 1.2474 | 20                          | 1.4440 | 1.4420           | 1.2513         | 1.2507         | 1.2505    | 1.2499 |       |
|                             | 31,750 | 36,551           | 36,525 | 31,725         | 31,709 | 31,699    | 31,684 |                             | 36,678 | 36,627           | 31,783         | 31,768         | 31,763    | 31,747 |       |
| 22                          | 1 3/8  | 1.5640           | 1.5630 | 1.3740         | 1.3734 | 1.3730    | 1.3724 | 22                          | 1.5699 | 1.5679           | 1.3763         | 1.3757         | 1.3755    | 1.3749 |       |
|                             | 34,925 | 39,726           | 39,700 | 34,900         | 34,884 | 34,874    | 34,859 |                             | 39,875 | 39,825           | 34,958         | 34,943         | 34,938    | 34,922 |       |
| 24                          | 1 1/2  | 1.7515           | 1.7505 | 1.4990         | 1.4984 | 1.4980    | 1.4974 | 24                          | 1.7544 | 1.7524           | 1.5013         | 1.5007         | 1.5005    | 1.4999 |       |
|                             | 38,100 | 44,488           | 44,463 | 38,075         | 38,059 | 38,049    | 38,034 |                             | 44,562 | 44,511           | 38,133         | 38,118         | 38,113    | 38,097 |       |
| 26                          | 1 5/8  | 1.8765           | 1.8755 | 1.6240         | 1.6234 | 1.6230    | 1.6224 | 26                          | 1.8818 | 1.8798           | 1.6263         | 1.6257         | 1.6255    | 1.6249 |       |
|                             | 41,275 | 47,663           | 47,638 | 41,250         | 41,234 | 41,224    | 41,209 |                             | 47,798 | 47,747           | 41,308         | 41,293         | 41,288    | 41,272 |       |
| 28                          | 1 3/4  | 2.0014           | 2.0002 | 1.7480         | 1.7474 | 1.7480    | 1.7474 | 28                          | 2.0065 | 2.0045           | 1.7513         | 1.7506         | 1.7505    | 1.7499 |       |
|                             | 44,450 | 50,836           | 50,805 | 44,399         | 44,384 | 44,399    | 44,384 |                             | 50,965 | 50,914           | 44,483         | 44,465         | 44,463    | 44,447 |       |
| 32                          | 2      | 2.2514           | 2.2502 | 1.9990         | 1.9983 | 1.9978    | 1.9971 | 32                          | 2.2565 | 2.2545           | 2.0013         | 2.0006         | 2.0005    | 1.9998 |       |
|                             | 50,800 | 57,186           | 57,155 | 50,775         | 50,757 | 50,744    | 50,726 |                             | 57,315 | 57,264           | 50,833         | 50,815         | 50,813    | 50,795 |       |

Table 9

## Housing and shaft tolerances by type of fit

Material : Corrosion-resistant steel

Series: 13B..Z..

13B..F..

13E..F..

## Interference fit in housing

| Nominal bore<br>Code | Size   | Housing diameter |        | Shaft diameter |        |           |        |
|----------------------|--------|------------------|--------|----------------|--------|-----------|--------|
|                      |        |                  |        | Transition fit |        | Loose fit |        |
|                      |        | Upper            | Lower  | Upper          | Lower  | Upper     | Lower  |
| –                    | in/mm  | in/mm            |        | in/mm          |        |           |        |
| 04                   | 1/4    | 0.3754           | 0.3750 | 0.2500         | 0.2495 | 0.2494    | 0.2489 |
|                      | 6,350  | 9,535            | 9,525  | 6,350          | 6,337  | 6,335     | 6,322  |
| 05                   | 5/16   | 0.4380           | 0.4375 | 0.3125         | 0.3120 | 0.3119    | 0.3114 |
|                      | 7,938  | 11,125           | 11,113 | 7,938          | 7,925  | 7,922     | 7,910  |
| 06                   | 3/8    | 0.5005           | 0.5000 | 0.3750         | 0.3745 | 0.3744    | 0.3739 |
|                      | 9,525  | 12,713           | 12,700 | 9,525          | 9,512  | 9,510     | 9,497  |
| 07                   | 7/16   | 0.5631           | 0.5624 | 0.4370         | 0.4365 | 0.4363    | 0.4358 |
|                      | 11,113 | 14,303           | 14,285 | 11,100         | 11,087 | 11,082    | 11,069 |
| 08                   | 1/2    | 0.6258           | 0.6251 | 0.4995         | 0.4990 | 0.4988    | 0.4983 |
|                      | 12,700 | 15,895           | 15,878 | 12,687         | 12,675 | 12,670    | 12,657 |
| 09                   | 9/16   | 0.6885           | 0.6878 | 0.5620         | 0.5615 | 0.5613    | 0.5608 |
|                      | 14,288 | 17,488           | 17,470 | 14,275         | 14,262 | 14,257    | 14,244 |
| 10                   | 5/8    | 0.8135           | 0.8127 | 0.6245         | 0.6240 | 0.6238    | 0.6233 |
|                      | 15,875 | 20,663           | 20,643 | 15,862         | 15,850 | 15,845    | 15,832 |
| 11                   | 11/16  | 0.8760           | 0.8752 | 0.6870         | 0.6865 | 0.6863    | 0.6858 |
|                      | 26,988 | 22,250           | 22,230 | 17,450         | 17,437 | 17,432    | 17,419 |
| 12                   | 3/4    | 0.9386           | 0.9378 | 0.7495         | 0.7490 | 0.7487    | 0.7482 |
|                      | 19,050 | 23,840           | 23,820 | 19,037         | 19,025 | 19,017    | 19,004 |
| 14                   | 7/8    | 1.0638           | 1.0630 | 0.8745         | 0.8740 | 0.8737    | 0.8732 |
|                      | 22,225 | 27,021           | 27,000 | 22,212         | 22,200 | 22,192    | 22,179 |
| 16                   | 1      | 1.1891           | 1.1883 | 0.9995         | 0.9990 | 0.9987    | 0.9982 |
|                      | 25,400 | 30,203           | 30,183 | 25,387         | 25,375 | 25,367    | 25,354 |
| 18                   | 1 1/8  | 1.3141           | 1.3131 | 1.1245         | 1.1240 | 1.1237    | 1.1232 |
|                      | 28,575 | 33,378           | 33,353 | 28,562         | 28,550 | 28,542    | 28,529 |
| 20                   | 1 1/4  | 1.4390           | 1.4380 | 1.2495         | 1.2489 | 1.2485    | 1.2479 |
|                      | 31,750 | 36,551           | 36,525 | 31,737         | 31,722 | 31,712    | 31,697 |
| 22                   | 1 3/8  | 1.5640           | 1.5630 | 1.3745         | 1.3739 | 1.3735    | 1.3729 |
|                      | 34,925 | 39,726           | 39,700 | 34,912         | 34,897 | 34,887    | 34,872 |
| 24                   | 1 1/2  | 1.7515           | 1.7505 | 1.4995         | 1.4989 | 1.4985    | 1.4979 |
|                      | 38,100 | 44,488           | 44,463 | 38,087         | 38,072 | 38,062    | 38,047 |
| 26                   | 1 5/8  | 1.8765           | 1.8755 | 1.6245         | 1.6239 | 1.6235    | 1.6229 |
|                      | 41,275 | 47,663           | 47,638 | 41,262         | 41,247 | 41,237    | 41,222 |
| 28                   | 1 3/4  | 2.0014           | 2.0002 | 1.7495         | 1.7489 | 1.7485    | 1.7479 |
|                      | 44,450 | 50,836           | 50,805 | 44,437         | 44,422 | 44,412    | 44,397 |
| 32                   | 2      | 2.2514           | 2.2502 | 1.9995         | 1.9988 | 1.9983    | 1.9976 |
|                      | 50,800 | 57,186           | 57,155 | 50,787         | 50,770 | 50,757    | 50,739 |

## Adhesive bonding to housing

| Nominal bore<br>Code | Housing diameter |        | Shaft diameter |        |           |        |
|----------------------|------------------|--------|----------------|--------|-----------|--------|
|                      |                  |        | Transition fit |        | Loose fit |        |
|                      | Upper            | Lower  | Upper          | Lower  | Upper     | Lower  |
| –                    | in/mm            |        | in/mm          |        |           |        |
| 04                   | 0.3800           | 0.3780 | 0.2513         | 0.2508 | 0.2505    | 0.2500 |
|                      | 9,652            | 9,601  | 6,383          | 6,370  | 6,363     | 6,350  |
| 05                   | 0.4426           | 0.4406 | 0.3138         | 0.3133 | 0.3130    | 0.3125 |
|                      | 11,242           | 11,191 | 7,971          | 7,958  | 7,950     | 7,938  |
| 06                   | 0.5051           | 0.5031 | 0.3763         | 0.3758 | 0.3755    | 0.3750 |
|                      | 12,830           | 12,779 | 9,558          | 9,545  | 9,538     | 9,525  |
| 07                   | 0.5677           | 0.5657 | 0.4388         | 0.4383 | 0.4380    | 0.4375 |
|                      | 14,420           | 14,369 | 11,146         | 11,133 | 11,125    | 11,113 |
| 08                   | 0.6305           | 0.6285 | 0.5013         | 0.5008 | 0.5005    | 0.5000 |
|                      | 16,015           | 15,964 | 12,733         | 12,720 | 12,713    | 12,700 |
| 09                   | 0.6932           | 0.6912 | 0.5638         | 0.5633 | 0.5630    | 0.5625 |
|                      | 17,607           | 17,556 | 14,321         | 14,308 | 14,300    | 14,288 |
| 10                   | 0.8181           | 0.8161 | 0.6263         | 0.6258 | 0.6255    | 0.6250 |
|                      | 20,780           | 20,729 | 15,908         | 15,895 | 15,888    | 15,875 |
| 11                   | 0.8806           | 0.8786 | 0.6888         | 0.6883 | 0.6880    | 0.6875 |
|                      | 22,367           | 22,316 | 17,496         | 17,483 | 17,475    | 17,463 |
| 12                   | 0.9432           | 0.9412 | 0.7513         | 0.7508 | 0.7505    | 0.7500 |
|                      | 23,957           | 23,906 | 19,083         | 19,070 | 19,063    | 19,050 |
| 14                   | 1.0684           | 1.0664 | 0.8763         | 0.8758 | 0.8755    | 0.8750 |
|                      | 27,137           | 27,087 | 22,258         | 22,245 | 22,238    | 22,225 |
| 16                   | 1.1938           | 1.1918 | 1.0013         | 1.0008 | 1.0005    | 1.0000 |
|                      | 30,323           | 30,272 | 25,433         | 25,420 | 25,413    | 25,400 |
| 18                   | 1.3189           | 1.3169 | 1.1265         | 1.1258 | 1.1255    | 1.1250 |
|                      | 33,500           | 33,449 | 28,613         | 28,595 | 28,588    | 28,575 |
| 20                   | 1.4440           | 1.4420 | 1.2513         | 1.2507 | 1.2505    | 1.2499 |
|                      | 36,678           | 36,627 | 31,783         | 31,768 | 31,763    | 31,747 |
| 22                   | 1.5699           | 1.5679 | 1.3763         | 1.3757 | 1.3755    | 1.3749 |
|                      | 39,875           | 39,825 | 34,958         | 34,943 | 34,938    | 34,922 |
| 24                   | 1.7544           | 1.7524 | 1.5013         | 1.5007 | 1.5005    | 1.4999 |
|                      | 44,562           | 44,511 | 38,133         | 38,118 | 38,113    | 38,097 |
| 26                   | 1.8818           | 1.8798 | 1.6263         | 1.6257 | 1.6255    | 1.6249 |
|                      | 47,798           | 47,747 | 41,308         | 41,293 | 41,288    | 41,272 |
| 28                   | 2.0065           | 2.0045 | 1.7513         | 1.7506 | 1.7505    | 1.7499 |
|                      | 50,965           | 50,914 | 44,483         | 44,465 | 44,463    | 44,447 |
| 32                   | 2.2565           | 2.2545 | 2.0013         | 2.0006 | 2.0005    | 1.9998 |
|                      | 57,315           | 57,264 | 50,833         | 50,815 | 50,813    | 50,795 |

# Bearing data

## Material

### Shell

#### Corrosion-resistant steel (CRES)

Characteristics:

- High strength
- Good fatigue resistance
- Good corrosion resistance without further treatment
- Mechanical properties stable at elevated temperatures; prolonged operation at temperatures > 120 °C (250 °F) possible

Unless otherwise specified, grades used per the applicable product standards are:

- 17-4PH to AMS5643 H1150 equivalent to EN 3161
- 431 to S.80 (FHT) equivalent to EN 3490

#### Aluminium alloy

Characteristics:

- Lightweight
- Favourable strength-to-weight ratio
- Corrosion-resistant with surface treatment
- Not suitable for continuous operating temperatures > 120 °C (250 °F)

Unless otherwise specified, grades used per the applicable product standards are:

- 2618 to DTD 5014 TF
- 2024 T3511 to EN 2704 or EN 2318, or 2024 T3 to EN 2701 per applicable EN bearing series
- 2024 to AMS-QQ-A-200/3 T8511 or AMS-QQ-A-225/6 T851 for bearing series other than EN

Refer to the relevant product tables.

### Liners

SKF standard high-performance liner types (X1 and Fiberslip) consist of woven PTFE yarns reinforced with structural fibres. The X1-40 liner variant has been qualified to AS 81934, AS 81820 and EN 2755.

For more information, refer to *Spherical plain bearings – Liner* **page 148**.

For detailed information about customized liners such as Textilub, contact your regional SKF Aerospace partner at: [skf.com/go/aero](http://skf.com/go/aero)

### Surface treatments

SKF standard surface treatments are described in **table 10**. For information about other surface treatments, contact your regional SKF Aerospace partner at: [skf.com/go/aero](http://skf.com/go/aero)

The bearing interface dimensions and tolerances from product tables are not modified when surface treatments are used.

**Table 10**

| Surface treatments        |                               |                                        |                                                                                                                                                           |
|---------------------------|-------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shell material            | Treatment                     | Specifications                         | Characteristics/function                                                                                                                                  |
| Corrosion-resistant steel | Passivation                   | AMS2700                                | <ul style="list-style-type: none"> <li>• enhanced corrosion resistance</li> </ul>                                                                         |
|                           | Cadmium <sup>1)</sup> plating | AMS03-19 <sup>2)</sup><br>AMS-QQ-P-416 | <ul style="list-style-type: none"> <li>• enhanced corrosion resistance</li> <li>• galvanic corrosion resistance</li> <li>• fretting resistance</li> </ul> |
|                           | Zinc-nickel plating           | AMS2417                                | <ul style="list-style-type: none"> <li>• enhanced corrosion resistance</li> <li>• galvanic corrosion resistance</li> <li>• fretting resistance</li> </ul> |
| Aluminium alloy           | Sulfuric acid anodizing       | AMS03-25 <sup>1)3)</sup><br>MIL-A-8625 | <ul style="list-style-type: none"> <li>• corrosion resistance</li> </ul>                                                                                  |

<sup>1)</sup> Treatment includes chromium 6 compounds and may be subject to environmental legislation.

<sup>2)</sup> Formerly DEF STAN 03-19

<sup>3)</sup> Formerly DEF STAN 03-25

# Bearing handling Lubrication

**NOTE:** Self-lubricating journal bearings must not be lubricated. Any lubricant can cause detrimental effects to the liner. For example, lubricants can cause stick-slip effects or result in variable frictional properties.

## Mounting

Journal bearings can be retained in the housing either by an interference fit or by using a retaining compound between the journal bearing and housing.

Interference fitting is recommended for all situations, except when a lined diameter reduction after installation is not acceptable or when ease of replacement is of primary concern.

## Interference fit

Bearings mounted with an interference can be pressed into the housing using a mandrel (**figure 1**).

A temperature difference between the bearing and housing (e.g. cooling the bearing with liquid nitrogen or refrigeration unit, or heating the housing) is recommended to ease mounting.

To counteract fretting or galvanic corrosion between metallic parts, a jointing compound can be applied.

## Retaining compound

Using a retaining compound between the journal bearing and housing allows for a clearance fit between bearing and housing. The effectiveness of the compound used should be tested to confirm its suitability for the application requirements

## Dismounting

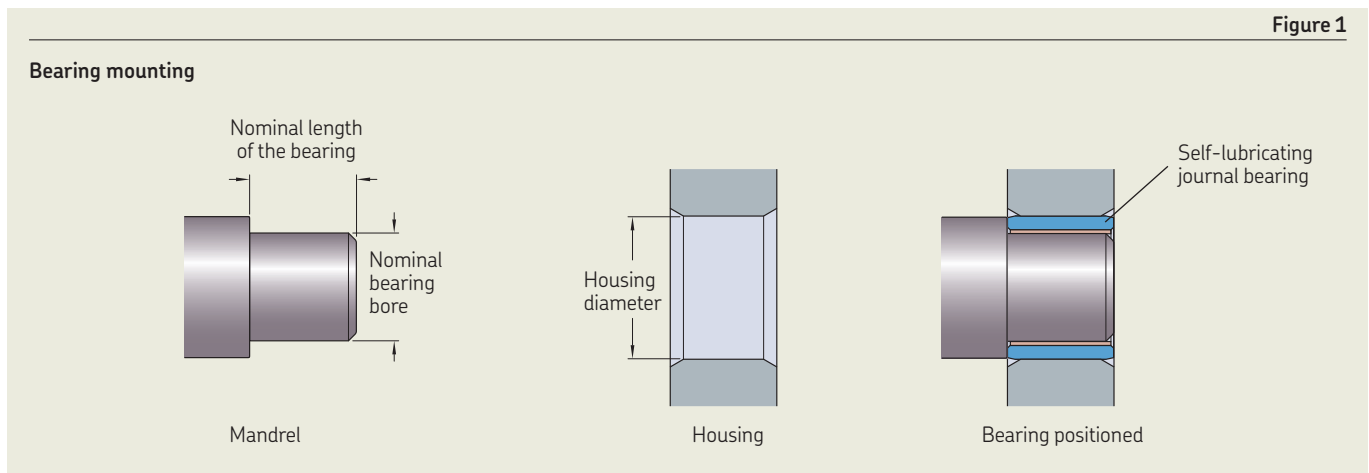
Journal bearings can be removed from application by pressing them out of their housing using the same mandrel design as recommended for mounting (**figure 1**).

A dismounted bearing should not be reused. SKF supplies oversized bearings, in a range of increments allowing for the reuse of existing housings.

## Storage

SKF self-lubricating journal bearings can be stored for up to 15 years if kept in their original, unopened and undamaged packaging. To fully utilize the maximum storage time, the temperature should be between 15 and 25 °C (60 and 75 °F) and the relative humidity kept in the range of 50 to 70%.

After 15 years of storage, the bearings can be returned to SKF for revalidation.





# Customized products

SKF designs and manufactures customized journal bearings to meet customer-specific application requirements. Some examples:



## Legacy products

The following legacy series can still be supplied:

- BCA1..., BCA1..M, BCA2..., BCA2..M
- BLA1..., BLA1..M, BLA2..., BLA2..M
- BFA1..., BFA-C-, BFA2..., BFA-A-
- BPA1..., BPA-C-, BPA2..., BPA-A-
- CDA..., CDA..R
- DJA..., DJA..R

## Legacy standards

SKF can supply bearings compliant to the following legacy standards:

- AGS3808, AGS3809, AGS3810, AGS3811
- PAN4832, PAN4833, PAN4834, PAN4835
- BAS7661, BAS7662, BAS7663, BAS7664

## Customer standards

Other ranges of standard self-lubricating journal bearings are also available, following customers standards, such as:

- ABS2171 to ABS2174
- ASNA2127 and ASNA2128
- BACB28AB, BACB28AV, BACB28AY, BACB28BF, ...
- NSA 8194 and NSA 8195

General customizations are listed in **table 11**

Table 11

### General customization

- **Geometry**
- **Dimensions**
- **Materials**
  - Alternative corrosion-resistant steels or aluminium alloys
  - Titanium alloys
  - Copper alloys

### • Surface treatments

Including:

- Chromic acid anodizing
- Hard chromium plating
- Silver plating
- Hard anodizing
- Dry film lubrication
- Tartaric sulfuric anodizing
- Chemical conversion

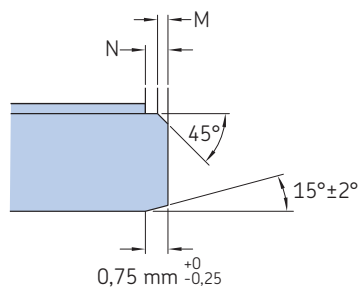
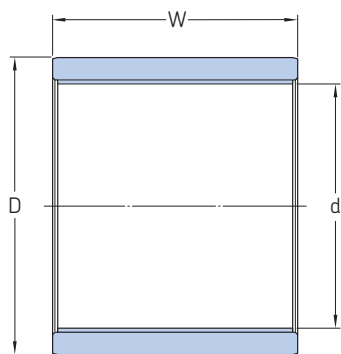
Certain treatments include chromium 6 compounds and may be subject to environmental legislation.

### Specific customization

- **Retention features**
  - Bolt holes, staked lip, circlip groove, ...
- **Liner type and thickness**
  - Textilub
  - X1
  - Fiberslip
- **Liner location**
- **Double journal bearings (bushpacks)**
- **Additional thrust washers**
- **Unlined journal bearings**

## 4.1 Plain bearings, EN 2285 and EN 2287 (metric dimensions)

13C..Z, ..K



**Technical specification**

EN 2311

**Product standard**

EN 2287 (Corrosion-resistant steel)  
EN 2285 (Aluminium alloy)

**Standard materials**

Corrosion-resistant steel:

13C..Z: 17-4PH  
..K: S.80

Aluminium alloy:

13C..Z and ..K: 2618 or 2024  
Surface treatment: Sulfuric acid anodized

Liner:

13C..Z: X1  
..K: Fiberslip

| M        | N        |
|----------|----------|
| mm       |          |
| max. 0,5 | max. 0,8 |

| Nominal bore Code | Dimensions |        |        |        | Length -0,1/-0,4 |    |    |    |    |    |    |
|-------------------|------------|--------|--------|--------|------------------|----|----|----|----|----|----|
|                   | d          |        | D      |        | W                |    |    |    |    |    |    |
|                   | Upper      | Lower  | Upper  | Lower  |                  |    |    |    |    |    |    |
|                   |            |        |        |        | 06               | 08 | 10 | 12 | 15 | 16 | 18 |
| –                 | mm         |        |        |        | mm               |    |    |    |    |    |    |
| 06                | 6,022      | 6,004  | 10,024 | 10,015 |                  |    |    |    |    |    |    |
| 08                | 8,027      | 8,005  | 12,029 | 12,018 |                  |    |    |    |    |    |    |
| 10                | 10,027     | 10,005 | 14,029 | 14,018 |                  |    |    |    |    |    |    |
| 12                | 12,033     | 12,006 | 16,029 | 16,018 |                  |    |    |    |    |    |    |
| 15                | 15,033     | 15,006 | 19,035 | 19,022 |                  |    |    |    |    |    |    |
| 16                | 16,033     | 16,006 | 20,035 | 20,022 |                  |    |    |    |    |    |    |
| 18                | 18,033     | 18,006 | 22,035 | 22,022 |                  |    |    |    |    | 1) |    |
| 20                | 20,040     | 20,007 | 25,035 | 25,022 |                  |    |    |    |    | 1) | 1) |
| 22                | 22,040     | 22,007 | 26,035 | 26,022 |                  |    |    |    |    | 1) | 1) |
| 25                | 25,040     | 25,007 | 30,035 | 30,022 |                  |    |    |    |    | 1) | 1) |
| 28                | 28,040     | 28,007 | 34,042 | 34,026 |                  |    |    |    |    | 1) | 1) |
| 30                | 30,040     | 30,007 | 36,042 | 36,026 |                  |    |    |    |    | 1) | 1) |
| 32                | 32,048     | 32,009 | 38,042 | 38,026 |                  |    |    |    |    | 1) | 1) |
| 35                | 35,048     | 35,009 | 42,042 | 42,026 |                  |    |    |    |    |    | 1) |
| 40                | 40,048     | 40,009 | 48,042 | 48,026 |                  |    |    |    |    |    |    |
| 45                | 45,048     | 45,009 | 52,051 | 52,032 |                  |    |    |    |    |    |    |
| 50                | 50,048     | 50,009 | 58,051 | 58,032 |                  |    |    |    |    |    |    |

1) SKF option

## Designation system

Examples: 13C0806AZY1 13C 06 08 A Z C Y1  
 13C3025SZC 13C 30 25 S Z C Y1  
 1008AKY2 10 08 A K C Y2

### Basic designation

#### Bore code

... Two digits, bore diameter [mm]

#### Length code

... Two digits, length [mm]

#### Material

S Corrosion-resistant steel (CRES)  
 A<sup>1)</sup> Aluminium alloy 2618  
 AA Aluminium alloy 2024

#### Surface treatment

No code Not plated CRES or anodized aluminium  
 C<sup>1)</sup> Cadmium plated on CRES  
 J<sup>1)</sup> Zinc-nickel plated on CRES

#### Over-size

No code Standard outer diameter size  
 Y1<sup>1)</sup> 0,1 mm oversized outer diameter  
 Y2<sup>1)</sup> 0,2 mm oversized outer diameter

<sup>1)</sup> SKF option

## More specifications

|                                    |     |
|------------------------------------|-----|
| Material . . . . .                 | 391 |
| Surface treatments . . . . .       | 391 |
| Liners . . . . .                   | 391 |
| Load carrying capability . . . . . | 384 |
| Friction and torque . . . . .      | 384 |
| Operating temperature . . . . .    | 384 |
| Fits and tolerances . . . . .      | 386 |
| Counterface surfaces . . . . .     | 386 |
| Bearing handling . . . . .         | 392 |

More options and sizes available than the standards offers, see 1).

## Customized journal bearings

Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

4.1



### Length –0,1/–0,4

W

20 22 25 28 30 32 35 40 45 50

mm

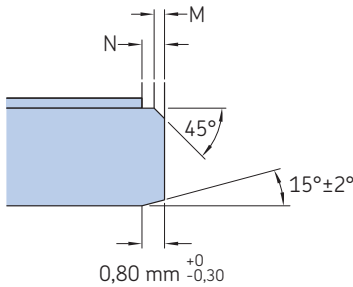
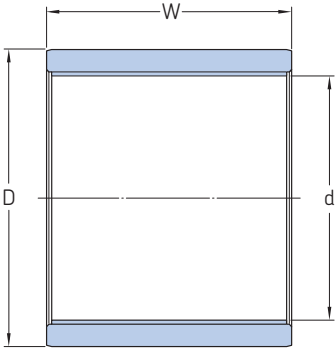
### Masses

CRES Aluminium alloy  
 Per mm Per mm  
 length (W) length (W)

g

|  |    |  |    |  |    |  |  |  |  |  |      |      |
|--|----|--|----|--|----|--|--|--|--|--|------|------|
|  |    |  |    |  |    |  |  |  |  |  | 0,39 | 0,15 |
|  |    |  |    |  |    |  |  |  |  |  | 0,48 | 0,18 |
|  |    |  |    |  |    |  |  |  |  |  | 0,58 | 0,22 |
|  |    |  |    |  |    |  |  |  |  |  | 0,68 | 0,26 |
|  |    |  |    |  |    |  |  |  |  |  | 0,82 | 0,31 |
|  |    |  |    |  |    |  |  |  |  |  | 0,87 | 0,32 |
|  |    |  |    |  |    |  |  |  |  |  | 0,97 | 0,37 |
|  |    |  |    |  |    |  |  |  |  |  | 1,36 | 0,51 |
|  |    |  |    |  |    |  |  |  |  |  | 1,16 | 0,44 |
|  |    |  |    |  |    |  |  |  |  |  | 1,66 | 0,63 |
|  |    |  |    |  |    |  |  |  |  |  | 2,25 | 0,85 |
|  |    |  | 1) |  |    |  |  |  |  |  | 2,40 | 0,91 |
|  |    |  | 1) |  |    |  |  |  |  |  | 2,54 | 0,96 |
|  |    |  | 1) |  | 1) |  |  |  |  |  | 3,26 | 1,23 |
|  | 1) |  | 1) |  | 1) |  |  |  |  |  | 4,25 | 1,61 |
|  | 1) |  | 1) |  | 1) |  |  |  |  |  | 4,11 | 1,55 |
|  |    |  | 1) |  | 1) |  |  |  |  |  | 5,22 | 1,98 |

4.2 Plain bearings (metric dimensions)  
13D..Z



Technical specification

–

Product standard

–

Standard materials

Corrosion-resistant steel:

17-4PH

Surface treatment:

Passivated

Aluminium alloy:

2024

Surface treatment:

Sulfuric acid anodized

Liner:

X1

M

N

mm

0,45<sup>-0,32</sup>

max. 0,60

| Nominal bore Code | Dimensions |        | Length –0,1/–0,4 |        | W  |    |    |    |    |    |    |
|-------------------|------------|--------|------------------|--------|----|----|----|----|----|----|----|
|                   | d Upper    | Lower  | D Upper          | Lower  | 06 | 08 | 10 | 12 | 15 | 18 | 20 |
| –                 | mm         |        |                  |        | mm |    |    |    |    |    |    |
| 06                | 6,022      | 6,004  | 10,024           | 10,015 |    |    |    |    |    |    |    |
| 08                | 8,027      | 8,005  | 12,029           | 12,018 |    |    |    |    |    |    |    |
| 10                | 10,027     | 10,005 | 14,029           | 14,018 |    |    |    |    |    |    |    |
| 12                | 12,033     | 12,006 | 16,029           | 16,018 |    |    |    |    |    |    |    |
| 15                | 15,033     | 15,006 | 19,035           | 19,022 |    |    |    |    |    |    |    |
| 16                | 16,033     | 16,006 | 20,035           | 20,022 |    |    |    |    |    |    |    |
| 18                | 18,033     | 18,006 | 22,035           | 22,022 |    |    |    |    |    |    |    |
| 20                | 20,040     | 20,007 | 25,035           | 25,022 |    |    |    |    |    |    |    |
| 22                | 22,040     | 22,007 | 26,035           | 26,022 |    |    |    |    |    |    |    |
| 25                | 25,040     | 25,007 | 30,035           | 30,022 |    |    |    |    |    |    |    |
| 28                | 28,040     | 28,007 | 34,042           | 34,026 |    |    |    |    |    |    |    |
| 30                | 30,040     | 30,007 | 36,042           | 36,026 |    |    |    |    |    |    |    |
| 32                | 32,048     | 32,009 | 38,042           | 38,026 |    |    |    |    |    |    |    |
| 35                | 35,048     | 35,009 | 42,042           | 42,026 |    |    |    |    |    |    |    |
| 40                | 40,048     | 40,009 | 48,042           | 48,026 |    |    |    |    |    |    |    |
| 45                | 45,048     | 45,009 | 52,051           | 52,032 |    |    |    |    |    |    |    |
| 50                | 50,048     | 50,009 | 58,051           | 58,032 |    |    |    |    |    |    |    |

## Designation system

|                          |                                       |     |    |    |   |   |   |    |
|--------------------------|---------------------------------------|-----|----|----|---|---|---|----|
| Examples:                | 13D0808AZ                             | 13D | 08 | 08 | A | Z | C | Y1 |
|                          | 13D1215SZCY1                          | 13D | 12 | 15 | S | Z |   |    |
| <b>Basic designation</b> |                                       |     |    |    |   |   |   |    |
| <b>Bore code</b>         |                                       |     |    |    |   |   |   |    |
| ...                      | Two digits, bore diameter [mm]        |     |    |    |   |   |   |    |
| <b>Length code</b>       |                                       |     |    |    |   |   |   |    |
| ...                      | Two digits, length [mm]               |     |    |    |   |   |   |    |
| <b>Material</b>          |                                       |     |    |    |   |   |   |    |
| S                        | Corrosion-resistant steel (CRES)      |     |    |    |   |   |   |    |
| A                        | Aluminium alloy                       |     |    |    |   |   |   |    |
| <b>Surface treatment</b> |                                       |     |    |    |   |   |   |    |
| No code                  | Not plated CRES or anodized aluminium |     |    |    |   |   |   |    |
| C                        | Cadmium plated on CRES                |     |    |    |   |   |   |    |
| J                        | Zinc-nickel plated on CRES            |     |    |    |   |   |   |    |
| <b>Oversize</b>          |                                       |     |    |    |   |   |   |    |
| No code                  | Standard outer diameter size          |     |    |    |   |   |   |    |
| Y1                       | 0,1 mm oversized outer diameter       |     |    |    |   |   |   |    |
| Y2                       | 0,2 mm oversized outer diameter       |     |    |    |   |   |   |    |

## More specifications

|                          |     |
|--------------------------|-----|
| Material                 | 391 |
| Surface treatments       | 391 |
| Liners                   | 391 |
| Load carrying capability | 384 |
| Friction and torque      | 384 |
| Operating temperature    | 384 |
| Fits and tolerances      | 386 |
| Counterface surfaces     | 386 |
| Bearing handling         | 392 |

## Customized journal bearings

Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

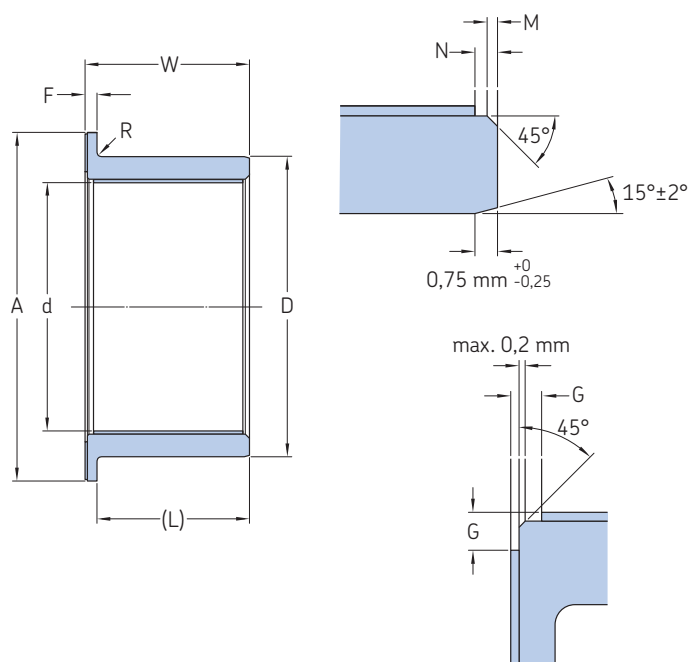
4.2



| Length –0,1/–0,4<br>W |    |    |    |    |    |    |    |  | Masses               |                      |
|-----------------------|----|----|----|----|----|----|----|--|----------------------|----------------------|
|                       |    |    |    |    |    |    |    |  | CRES                 | Aluminium alloy      |
|                       |    |    |    |    |    |    |    |  | Per mm length<br>(W) | Per mm<br>length (W) |
| 22                    | 25 | 28 | 30 | 35 | 40 | 45 | 50 |  |                      |                      |
| mm                    |    |    |    |    |    |    |    |  | g                    |                      |
|                       |    |    |    |    |    |    |    |  | 0,44                 | 0,18                 |
|                       |    |    |    |    |    |    |    |  | 0,55                 | 0,22                 |
|                       |    |    |    |    |    |    |    |  | 0,66                 | 0,26                 |
|                       |    |    |    |    |    |    |    |  | 0,77                 | 0,31                 |
|                       |    |    |    |    |    |    |    |  | 0,92                 | 0,37                 |
|                       |    |    |    |    |    |    |    |  | 0,98                 | 0,40                 |
|                       |    |    |    |    |    |    |    |  | 1,09                 | 0,44                 |
|                       |    |    |    |    |    |    |    |  | 1,41                 | 0,56                 |
|                       |    |    |    |    |    |    |    |  | 1,14                 | 0,46                 |
|                       |    |    |    |    |    |    |    |  | 1,72                 | 0,68                 |
|                       |    |    |    |    |    |    |    |  | 2,40                 | 0,94                 |
|                       |    |    |    |    |    |    |    |  | 2,55                 | 0,99                 |
|                       |    |    |    |    |    |    |    |  | 2,70                 | 1,05                 |
|                       |    |    |    |    |    |    |    |  | 2,95                 | 1,54                 |
|                       |    |    |    |    |    |    |    |  | 4,69                 | 1,78                 |
|                       |    |    |    |    |    |    |    |  | 4,51                 | 1,72                 |
|                       |    |    |    |    |    |    |    |  | 5,75                 | 2,18                 |

## 4.3 Flanged bearings (metric dimensions)

13C..F, ..F..K



### Technical specification

EN 2311

### Product standards

EN 2288 (Corrosion-resistant steel)  
EN 2286 (Aluminium alloy)

### Standard materials

Corrosion-resistant steel:

13C..F: 17-4PH  
..F..K: S.80

Aluminium alloy:

13C..F and ..F..K: 2618 or 2024  
Surface treatment: Sulfuric acid anodized

Liner:

13C..F: X1  
..F..K: Fiberslip

| Nominal bore code | M        | N        | R                     | G                     |
|-------------------|----------|----------|-----------------------|-----------------------|
| –                 | mm       |          |                       |                       |
| ≤ 10              | max. 0,5 | max. 0,8 | 0,4 <sup>-0,3</sup>   | 0,90 <sup>-0,25</sup> |
| 12 to 18          | max. 0,5 | max. 0,8 | 0,75 <sup>-0,25</sup> | 0,90 <sup>-0,25</sup> |
| ≥ 20              | max. 0,5 | max. 0,8 | 0,75 <sup>-0,25</sup> | 1,20 <sup>-0,25</sup> |

| Nominal<br>bore<br>Code | Dimensions |        | D      | F      | A   | Length –0,1/–0,4 |       |         |         |    |    |    |    |    |    |    |  |
|-------------------------|------------|--------|--------|--------|-----|------------------|-------|---------|---------|----|----|----|----|----|----|----|--|
|                         | Upper      | Lower  |        |        |     | Upper            | Lower | 0/–0,15 | 0/–0,25 | W  |    |    |    |    |    |    |  |
|                         |            |        |        |        |     |                  |       |         |         | 06 | 08 | 10 | 12 | 15 | 16 | 18 |  |
| –                       | mm         |        |        |        |     | mm               |       |         |         |    |    |    |    |    |    |    |  |
| 06                      | 6,022      | 6,004  | 10,024 | 10,015 | 1,5 | 12,0             |       |         |         |    |    |    |    |    |    |    |  |
| 08                      | 8,027      | 8,005  | 12,029 | 12,018 | 1,5 | 14,0             |       |         |         |    |    |    |    |    |    |    |  |
| 10                      | 10,027     | 10,005 | 14,029 | 14,018 | 1,5 | 16,0             |       |         |         |    |    |    |    |    |    |    |  |
| 12                      | 12,033     | 12,006 | 16,029 | 16,018 | 1,5 | 22,0             |       |         |         |    |    |    |    |    |    |    |  |
| 15                      | 15,033     | 15,006 | 19,035 | 19,022 | 1,5 | 25,0             |       |         |         |    |    |    |    |    |    |    |  |
| 16                      | 16,033     | 16,006 | 20,035 | 20,022 | 1,5 | 26,0             |       |         |         |    |    |    |    |    |    |    |  |
| 18                      | 18,033     | 18,006 | 22,035 | 22,022 | 1,5 | 28,0             |       |         |         |    |    | 1) |    |    |    |    |  |
| 20                      | 20,040     | 20,007 | 25,035 | 25,022 | 1,5 | 30,0             |       |         |         |    |    | 1) | 1) |    |    |    |  |
| 22                      | 22,040     | 22,007 | 26,035 | 26,022 | 1,5 | 32,0             |       |         |         |    |    | 1) | 1) |    |    |    |  |
| 25                      | 25,040     | 25,007 | 30,035 | 30,022 | 1,5 | 35,0             |       |         |         |    |    | 1) | 1) |    |    |    |  |
| 28                      | 28,040     | 28,007 | 34,042 | 34,026 | 2,5 | 40,0             |       |         |         |    |    | 1) | 1) |    |    |    |  |
| 30                      | 30,040     | 30,007 | 36,042 | 36,026 | 2,5 | 42,0             |       |         |         |    |    | 1) | 1) |    |    |    |  |
| 32                      | 32,048     | 32,009 | 38,042 | 38,026 | 2,5 | 44,0             |       |         |         |    |    | 1) | 1) |    |    |    |  |
| 35                      | 35,048     | 35,009 | 42,042 | 42,026 | 2,5 | 47,0             |       |         |         |    |    | 1) | 1) |    |    |    |  |
| 40                      | 40,048     | 40,009 | 48,042 | 48,026 | 2,5 | 52,0             |       |         |         |    |    |    |    |    |    |    |  |
| 45                      | 45,048     | 45,009 | 52,051 | 52,032 | 2,5 | 57,0             |       |         |         |    |    |    |    |    |    |    |  |
| 50                      | 50,048     | 50,009 | 58,051 | 58,032 | 2,5 | 62,0             |       |         |         |    |    |    |    |    |    |    |  |

1) SKF option

## Designation system

Examples: 13C0808AFY1 13C 08 08 A F Y1  
 13C2020SFC 13C 20 20 S F F  
 3220FAKY2 32 20 F F A K C Y2

### Basic designation

#### Bore code

... Two digits, bore diameter [mm]

#### Length code

... Two digits, length [mm]

#### Material

S Corrosion-resistant steel (CRES)

A<sup>1)</sup> Aluminium alloy 2618

AA Aluminium alloy 2024

#### Surface treatment

No code Not plated CRES or anodized aluminium

C<sup>1)</sup> Cadmium plated on CRES

J<sup>1)</sup> Zinc-nickel plated on CRES

#### Oversize

No code Standard outer diameter size

Y1<sup>1)</sup> 0,1 mm oversized outer diameter

Y2<sup>1)</sup> 0,2 mm oversized outer diameter

<sup>1)</sup> SKF option

## More specifications

|                                    |     |
|------------------------------------|-----|
| Material . . . . .                 | 391 |
| Surface treatments . . . . .       | 391 |
| Liners . . . . .                   | 391 |
| Load carrying capability . . . . . | 384 |
| Friction and torque . . . . .      | 384 |
| Operating temperature . . . . .    | 384 |
| Fits and tolerances . . . . .      | 386 |
| Counterface surfaces . . . . .     | 386 |
| Bearing handling . . . . .         | 392 |

More options and sizes available than the standards offers, see 1).

## Customized journal bearings

Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

4.3



### Length –0,1/–0,4

W

20 22 25 28 30 32 35 40 45 50

mm

### Masses

CRES

Per mm  
length (L)

Flange

Aluminium alloy

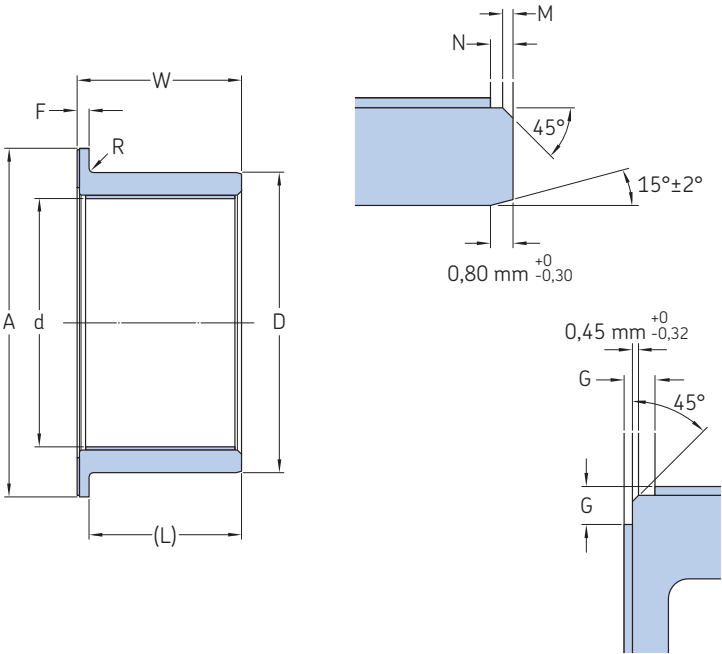
Per mm  
length (L)

Flange

g

|  |    |  |    |  |    |  |  |  |  |  |      |      |      |      |
|--|----|--|----|--|----|--|--|--|--|--|------|------|------|------|
|  |    |  |    |  |    |  |  |  |  |  | 0,46 | 0,44 | 0,18 | 0,18 |
|  |    |  |    |  |    |  |  |  |  |  | 0,55 | 0,55 | 0,21 | 0,22 |
|  |    |  |    |  |    |  |  |  |  |  | 0,65 | 0,66 | 0,24 | 0,26 |
|  |    |  |    |  |    |  |  |  |  |  | 0,91 | 0,77 | 0,35 | 0,31 |
|  |    |  |    |  |    |  |  |  |  |  | 1,03 | 0,92 | 0,39 | 0,37 |
|  |    |  |    |  |    |  |  |  |  |  | 1,08 | 0,98 | 0,40 | 0,40 |
|  |    |  |    |  |    |  |  |  |  |  | 1,16 | 1,09 | 0,44 | 0,44 |
|  |    |  |    |  |    |  |  |  |  |  | 1,53 | 1,41 | 0,57 | 0,56 |
|  |    |  |    |  |    |  |  |  |  |  | 1,34 | 1,14 | 0,51 | 0,46 |
|  |    |  |    |  |    |  |  |  |  |  | 1,82 | 1,72 | 0,69 | 0,68 |
|  |    |  |    |  |    |  |  |  |  |  | 2,56 | 2,40 | 0,97 | 0,94 |
|  |    |  | 1) |  |    |  |  |  |  |  | 2,77 | 2,55 | 1,03 | 0,99 |
|  |    |  | 1) |  |    |  |  |  |  |  | 2,85 | 2,70 | 1,08 | 1,05 |
|  |    |  | 1) |  | 1) |  |  |  |  |  | 3,50 | 2,95 | 1,32 | 1,54 |
|  | 1) |  | 1) |  | 1) |  |  |  |  |  | 4,45 | 4,69 | 1,69 | 1,78 |
|  | 1) |  | 1) |  | 1) |  |  |  |  |  | 4,34 | 4,51 | 1,64 | 1,72 |
|  |    |  | 1) |  | 1) |  |  |  |  |  | 5,41 | 5,75 | 2,05 | 2,18 |

4.4 Flanged bearings (metric dimensions)  
13D..F



Technical specification

Product standards

Standard materials

Corrosion-resistant steel:

Surface treatment:

Aluminium alloy:

Liner:

17-4PH

Passivated

2024

Sulfuric acid anodized X1

| M                     | N         | R                     | G                   |
|-----------------------|-----------|-----------------------|---------------------|
| mm                    |           |                       |                     |
| 0,45 <sup>-0,32</sup> | max. 0,60 | 0,80 <sup>-0,30</sup> | 1,0 <sup>-0,5</sup> |

| Nominal<br>bore<br>Code | Dimensions |        | D<br>Upper | Lower  | F<br>0/−0,15 | A<br>0/−0,25 | Length −0,1/−0,4<br>W |    |    |    |    |    |
|-------------------------|------------|--------|------------|--------|--------------|--------------|-----------------------|----|----|----|----|----|
|                         | d<br>Upper | Lower  |            |        |              |              | 06                    | 08 | 10 | 12 | 15 | 18 |
|                         | mm         |        |            |        |              |              | mm                    |    |    |    |    |    |
| 06                      | 6,022      | 6,004  | 10,024     | 10,015 | 1,5          | 14,0         |                       |    |    |    |    |    |
| 08                      | 8,027      | 8,005  | 12,029     | 12,018 | 1,5          | 16,0         |                       |    |    |    |    |    |
| 10                      | 10,027     | 10,005 | 14,029     | 14,018 | 1,5          | 18,0         |                       |    |    |    |    |    |
| 12                      | 12,033     | 12,006 | 16,029     | 16,018 | 1,5          | 22,0         |                       |    |    |    |    |    |
| 15                      | 15,033     | 15,006 | 19,035     | 19,022 | 1,5          | 25,0         |                       |    |    |    |    |    |
| 16                      | 16,033     | 16,006 | 20,035     | 20,022 | 1,5          | 26,0         |                       |    |    |    |    |    |
| 18                      | 18,033     | 18,006 | 22,035     | 22,022 | 1,5          | 28,0         |                       |    |    |    |    |    |
| 20                      | 20,040     | 20,007 | 25,035     | 25,022 | 1,5          | 31,0         |                       |    |    |    |    |    |
| 22                      | 22,040     | 22,007 | 26,035     | 26,022 | 1,5          | 32,0         |                       |    |    |    |    |    |
| 25                      | 25,040     | 25,007 | 30,035     | 30,022 | 1,5          | 36,0         |                       |    |    |    |    |    |
| 28                      | 28,040     | 28,007 | 34,042     | 34,026 | 2,5          | 40,0         |                       |    |    |    |    |    |
| 30                      | 30,040     | 30,007 | 36,042     | 36,026 | 2,5          | 42,0         |                       |    |    |    |    |    |
| 32                      | 32,048     | 32,009 | 38,042     | 38,026 | 2,5          | 44,0         |                       |    |    |    |    |    |
| 35                      | 35,048     | 35,009 | 42,042     | 42,026 | 2,5          | 48,0         |                       |    |    |    |    |    |
| 40                      | 40,048     | 40,009 | 48,042     | 48,026 | 2,5          | 55,0         |                       |    |    |    |    |    |
| 45                      | 45,048     | 45,009 | 52,051     | 52,032 | 2,5          | 59,0         |                       |    |    |    |    |    |
| 50                      | 50,048     | 50,009 | 58,051     | 58,032 | 2,5          | 65,0         |                       |    |    |    |    |    |





## Designation system

|           |             |     |    |    |   |   |   |    |
|-----------|-------------|-----|----|----|---|---|---|----|
| Examples: | 13D0808AFY1 | 13D | 08 | 08 | A | F |   | Y1 |
|           | 13D1012SFC  | 13D | 10 | 12 | S | F | C |    |
|           | 13D3540AFY2 | 13D | 35 | 40 | A | F |   | Y2 |

### Basic designation

#### Bore code

... Two digits, bore diameter [mm]

#### Length code

... Two digits, length [mm]

#### Material

S Corrosion-resistant steel (CRES)  
A Aluminium alloy

#### Surface treatment

No code Passivated CRES or sulfuric acid anodised aluminium  
C Cadmium plated on CRES  
J Zinc-nickel plated on CRES

#### Oversize

No code Standard outer diameter size  
Y1 0,1 mm oversized outer diameter  
Y2 0,2 mm oversized outer diameter

## More specifications

|                                    |     |
|------------------------------------|-----|
| Material . . . . .                 | 391 |
| Surface treatments . . . . .       | 391 |
| Liners . . . . .                   | 391 |
| Load carrying capability . . . . . | 384 |
| Friction and torque . . . . .      | 384 |
| Operating temperature . . . . .    | 384 |
| Fits and tolerances . . . . .      | 386 |
| Counterface surfaces . . . . .     | 386 |
| Bearing handling . . . . .         | 392 |

## Customized journal bearings

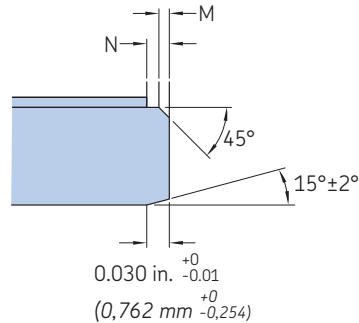
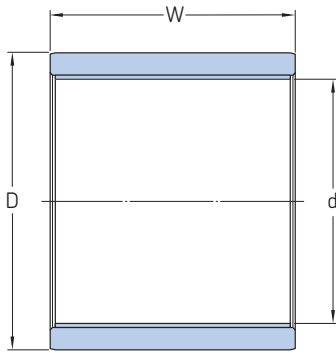
Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

### Length –0,1/–0,4

| Length –0,1/–0,4 |    |    |    |    |    |    |    |    | Masses                       |        |                                         |        |
|------------------|----|----|----|----|----|----|----|----|------------------------------|--------|-----------------------------------------|--------|
| W                |    |    |    |    |    |    |    |    | CRES<br>Per mm<br>length (L) | Flange | Aluminium alloy<br>Per mm<br>length (L) | Flange |
| 20               | 22 | 25 | 28 | 30 | 35 | 40 | 45 | 50 |                              |        |                                         |        |
| mm               |    |    |    |    |    |    |    |    | g                            |        |                                         |        |
|                  |    |    |    |    |    |    |    |    | 0,31                         | 1,47   | 0,11                                    | 0,66   |
|                  |    |    |    |    |    |    |    |    | 0,38                         | 1,76   | 0,14                                    | 0,80   |
|                  |    |    |    |    |    |    |    |    | 0,46                         | 2,06   | 0,16                                    | 0,93   |
|                  |    |    |    |    |    |    |    |    | 0,54                         | 3,12   | 0,19                                    | 1,41   |
|                  |    |    |    |    |    |    |    |    | 0,78                         | 3,67   | 0,28                                    | 1,66   |
|                  |    |    |    |    |    |    |    |    | 0,82                         | 3,86   | 0,29                                    | 1,74   |
|                  |    |    |    |    |    |    |    |    | 0,91                         | 4,23   | 0,32                                    | 1,91   |
|                  |    |    |    |    |    |    |    |    | 1,28                         | 5,15   | 0,46                                    | 2,33   |
|                  |    |    |    |    |    |    |    |    | 1,10                         | 4,96   | 0,39                                    | 2,24   |
|                  |    |    |    |    |    |    |    |    | 1,57                         | 6,16   | 0,56                                    | 2,79   |
|                  |    |    |    |    |    |    |    |    | 1,99                         | 12,49  | 0,71                                    | 5,65   |
|                  |    |    |    |    |    |    |    |    | 2,12                         | 13,23  | 0,75                                    | 5,98   |
|                  |    |    |    |    |    |    |    |    | 2,25                         | 13,96  | 0,80                                    | 6,31   |
|                  |    |    |    |    |    |    |    |    | 2,89                         | 16,52  | 1,03                                    | 7,47   |
|                  |    |    |    |    |    |    |    |    | 3,77                         | 21,81  | 1,34                                    | 9,86   |
|                  |    |    |    |    |    |    |    |    | 3,74                         | 22,29  | 1,33                                    | 10,08  |
|                  |    |    |    |    |    |    |    |    | 4,76                         | 26,41  | 1,69                                    | 11,94  |

## 4.5 Plain bearings (inch dimensions)

13A..Z., K..P



|                                |                                                                    |
|--------------------------------|--------------------------------------------------------------------|
| <b>Technical specification</b> | AS 8943                                                            |
| <b>Product standard</b>        | NSA 8145 (Corrosion-resistant steel)<br>NSA 8146 (Aluminium alloy) |
| <b>Standard materials</b>      |                                                                    |
| Corrosion-resistant steel:     |                                                                    |
| 13A..Z. and K..P:              | S.80                                                               |
| Aluminium alloy:               |                                                                    |
| 13A..Z. and K..P:              | 2618                                                               |
| Surface treatment:             | Sulfuric acid anodized                                             |
| Liner:                         |                                                                    |
| 13A..Z.:                       | X1                                                                 |
| K..P:                          | Fiberslip                                                          |

| Nominal bore code | M                        | N                        |
|-------------------|--------------------------|--------------------------|
|                   | in/mm                    |                          |
| ≤ 12              | max. 0.010<br>max. 0,254 | max. 0.025<br>max. 0,635 |
| ≥ 14              | max. 0.020<br>max. 0,508 | max. 0.025<br>max. 0,635 |

| Nominal bore |      | Dimensions |       |       |       | Length (W) −0.005/−0.015 (−0,127/−0,381) |              |            |             |             |              |            |
|--------------|------|------------|-------|-------|-------|------------------------------------------|--------------|------------|-------------|-------------|--------------|------------|
| Dia-meter    | Code | d          |       | D     |       | 5/32                                     | 3/16         | 1/4        | 5/16        | 3/8         | 7/16         | 1/2        |
|              |      | Upper      | Lower | Upper | Lower | 3,968<br>02 <sup>3)</sup>                | 4,7625<br>03 | 6,35<br>04 | 7,935<br>05 | 9,525<br>06 | 11,115<br>07 | 12,7<br>08 |
| in           |      | in/mm      |       |       |       | in/mm                                    |              |            |             |             |              |            |

|       |    |                  |                  |                  |                  |  |  |  |    |    |    |  |
|-------|----|------------------|------------------|------------------|------------------|--|--|--|----|----|----|--|
| 1/4   | 04 | 0.2512<br>6,401  | 0.2503<br>6,358  | 0.3760<br>9,550  | 0.3755<br>9,538  |  |  |  |    |    |    |  |
| 5/16  | 05 | 0.3139<br>7,973  | 0.3130<br>7,950  | 0.4386<br>11,140 | 0.4381<br>11,128 |  |  |  |    |    | 2) |  |
| 3/8   | 06 | 0.3765<br>9,563  | 0.3756<br>9,540  | 0.5011<br>12,728 | 0.5006<br>12,715 |  |  |  |    |    | 2) |  |
| 7/16  | 07 | 0.4405<br>11,188 | 0.4395<br>11,164 | 0.6269<br>15,924 | 0.6260<br>15,900 |  |  |  |    |    | 2) |  |
| 1/2   | 08 | 0.5016<br>12,741 | 0.5006<br>12,715 | 0.6888<br>17,496 | 0.6883<br>17,483 |  |  |  |    |    | 2) |  |
| 5/8   | 10 | 0.6267<br>15,918 | 0.6257<br>15,893 | 0.8139<br>20,673 | 0.8134<br>20,660 |  |  |  |    |    | 2) |  |
| 3/4   | 12 | 0.7520<br>19,101 | 0.7508<br>19,070 | 0.9389<br>23,848 | 0.9384<br>23,835 |  |  |  |    |    | 2) |  |
| 7/8   | 14 | 0.8771<br>22,278 | 0.8759<br>22,248 | 1.0640<br>27,026 | 1.0635<br>27,013 |  |  |  |    |    | 2) |  |
| 1     | 16 | 1.0022<br>25,456 | 1.0010<br>25,425 | 1.1890<br>30,201 | 1.1885<br>30,188 |  |  |  |    |    | 2) |  |
| 1 1/8 | 18 | 1.1275<br>28,639 | 1.1263<br>28,608 | 1.3143<br>33,383 | 1.3137<br>33,368 |  |  |  | 1) |    | 2) |  |
| 1 1/4 | 20 | 1.2528<br>31,821 | 1.2512<br>31,780 | 1.5019<br>38,148 | 1.5013<br>38,133 |  |  |  | 1) |    | 2) |  |
| 1 3/8 | 22 | 1.3779<br>34,999 | 1.3763<br>34,958 | 1.6269<br>41,323 | 1.6263<br>41,308 |  |  |  | 1) |    | 2) |  |
| 1 1/2 | 24 | 1.5029<br>38,174 | 1.5013<br>38,133 | 1.7519<br>44,498 | 1.7513<br>44,483 |  |  |  | 1) |    | 2) |  |
| 1 3/4 | 28 | 1.7533<br>44,534 | 1.7517<br>44,493 | 2.0023<br>50,858 | 2.0016<br>50,841 |  |  |  |    | 1) | 2) |  |
| 2     | 32 | 2.0035<br>50,889 | 2.0017<br>50,843 | 2.2523<br>57,208 | 2.2516<br>57,191 |  |  |  |    | 1) | 2) |  |

1) SKF option for corrosion-resistant steel bearings

2) SKF option

3) Code 02 corresponds to a length of 2.5/16 in

## Designation system

Examples: 13AAZ0403Y1 13ASZ1012C KA0403PY2

### Basic designation

#### Material

S Corrosion-resistant steel (CRES)  
A Aluminium alloy

#### Bore code

... Two digits, see *Nominal bore code (multiples of 1/16 inch)*

#### Length code

... Two digits, see *Length code (multiples of 1/16 inch)*

#### Surface treatment

No code Not plated CRES or anodized aluminium  
C<sup>1)</sup> Cadmium plated on CRES  
J<sup>1)</sup> Zinc-nickel plated on CRES

#### Oversize

No code Standard outer diameter size  
Y1<sup>1)</sup> 0.005 in oversized outer diameter  
Y2<sup>1)</sup> 0.010 in oversized outer diameter

<sup>1)</sup> SKF option

## More specifications

|                                    |     |
|------------------------------------|-----|
| Material . . . . .                 | 391 |
| Surface treatments . . . . .       | 391 |
| Liners . . . . .                   | 391 |
| Load carrying capability . . . . . | 384 |
| Friction and torque . . . . .      | 384 |
| Operating temperature . . . . .    | 384 |
| Fits and tolerances . . . . .      | 386 |
| Counterface surfaces . . . . .     | 386 |
| Bearing handling . . . . .         | 392 |

More options and sizes available than the standards offers, see 1) and 2).

## Customized journal bearings

Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

4.5



### Length (W) –0.005/–0.015 (–0.127/–0.381)

|       |       |       |      |       |       |      |       |      |
|-------|-------|-------|------|-------|-------|------|-------|------|
| 5/8   | 3/4   | 7/8   | 1    | 1 1/4 | 1 1/2 | 2    | 2 1/2 | 3    |
| 15,88 | 19,05 | 22,23 | 25,5 | 31,75 | 38,1  | 50,8 | 63,5  | 76,2 |
| 10    | 12    | 14    | 16   | 20    | 24    | 32   | 40    | 48   |

in/mm

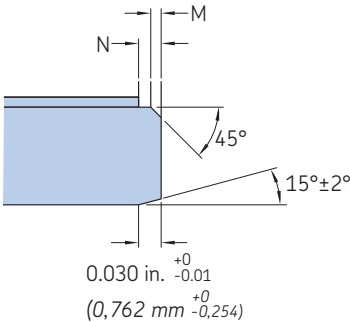
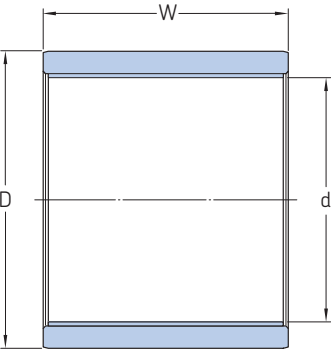
### Masses

|                     |                     |
|---------------------|---------------------|
| CRES                | Aluminium alloy     |
| Per inch length (W) | Per inch length (W) |

lb/g

|  |  |    |  |  |  |  |  |  |  |         |        |
|--|--|----|--|--|--|--|--|--|--|---------|--------|
|  |  |    |  |  |  |  |  |  |  | 0.012   | 0.007  |
|  |  |    |  |  |  |  |  |  |  | 5,443   | 3,175  |
|  |  |    |  |  |  |  |  |  |  | 0.020   | 0.008  |
|  |  |    |  |  |  |  |  |  |  | 9,072   | 3,629  |
|  |  |    |  |  |  |  |  |  |  | 0.024   | 0.009  |
|  |  |    |  |  |  |  |  |  |  | 10,886  | 4,082  |
|  |  |    |  |  |  |  |  |  |  | 0.044   | 0.015  |
|  |  |    |  |  |  |  |  |  |  | 20,063  | 6,804  |
|  |  |    |  |  |  |  |  |  |  | 0.050   | 0.019  |
|  |  |    |  |  |  |  |  |  |  | 22,680  | 8,618  |
|  |  | 2) |  |  |  |  |  |  |  | 0.060   | 0.023  |
|  |  |    |  |  |  |  |  |  |  | 27,216  | 10,433 |
|  |  | 2) |  |  |  |  |  |  |  | 0.070   | 0.027  |
|  |  |    |  |  |  |  |  |  |  | 31,751  | 12,247 |
|  |  | 2) |  |  |  |  |  |  |  | 0.075   | 0.030  |
|  |  |    |  |  |  |  |  |  |  | 34,019  | 13,608 |
|  |  | 2) |  |  |  |  |  |  |  | 0.084   | 0.034  |
|  |  |    |  |  |  |  |  |  |  | 38,102  | 15,422 |
|  |  | 2) |  |  |  |  |  |  |  | 0.093   | 0.038  |
|  |  |    |  |  |  |  |  |  |  | 42,184  | 17,236 |
|  |  | 2) |  |  |  |  |  |  |  | 0.146   | 0.058  |
|  |  |    |  |  |  |  |  |  |  | 66,224  | 26,308 |
|  |  | 2) |  |  |  |  |  |  |  | 0.160   | 0.063  |
|  |  |    |  |  |  |  |  |  |  | 72,575  | 28,576 |
|  |  | 2) |  |  |  |  |  |  |  | 0.173   | 0.068  |
|  |  |    |  |  |  |  |  |  |  | 78,471  | 30,844 |
|  |  | 2) |  |  |  |  |  |  |  | 0.200   | 0.078  |
|  |  |    |  |  |  |  |  |  |  | 90,718  | 35,380 |
|  |  | 2) |  |  |  |  |  |  |  | 0.225   | 0.089  |
|  |  |    |  |  |  |  |  |  |  | 102,058 | 40,370 |

4.6 Plain bearings (inch dimensions)  
13B..Z..



|                            |                        |
|----------------------------|------------------------|
| Technical specification    | AS 81934               |
| Product standard           | AS 81934/1             |
| Standard materials         |                        |
| Corrosion-resistant steel: | 17-4PH                 |
| Surface treatment:         | Passivated             |
| Aluminium alloy:           | 2024                   |
| Surface treatment:         | Sulfuric acid anodized |
| Liner:                     | X1                     |

| Length code | M                        | N                        |
|-------------|--------------------------|--------------------------|
|             | in/mm                    |                          |
| ≤ 12        | max. 0.005<br>max. 0,127 | max. 0.010<br>max. 0,254 |
| ≥ 14        | max. 0.015<br>max. 0,381 | max. 0.025<br>max. 0,635 |

| Nominal bore |      | Dimensions |                                  | Length (W) 0/-0.01 0/-0,254 |      |      |      |      |      |       |      |       |      |       |       |       |  |
|--------------|------|------------|----------------------------------|-----------------------------|------|------|------|------|------|-------|------|-------|------|-------|-------|-------|--|
| Dia-meter    | Code | d          | D                                | 5/32                        | 3/16 | 7/32 | 1/4  | 9/32 | 5/16 | 11/32 | 3/8  | 7/16  | 1/2  | 9/16  | 5/8   | 11/16 |  |
|              |      | 0/-0.0010  | CRES 0/-0.0005 (0/-0,013)        | 3,97                        | 4,76 | 5,56 | 6,35 | 7,14 | 7,94 | 8,73  | 9,53 | 11,11 | 12,7 | 14,29 | 15,88 | 17,46 |  |
|              |      | 0/-0,0254  | Aluminium alloy ±0.0005 (±0.013) | 05                          | 06   | 07   | 08   | 09   | 10   | 11    | 12   | 14    | 16   | 18    | 20    | 22    |  |
| in           |      | in/mm      |                                  | in/mm                       |      |      |      |      |      |       |      |       |      |       |       |       |  |

|       |    |                  |                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------|----|------------------|------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 1/4   | 04 | 0.2515<br>6,388  | 0.3760<br>9,550  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5/16  | 05 | 0.3140<br>7,976  | 0.4386<br>11,140 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3/8   | 06 | 0.3765<br>9,563  | 0.5012<br>12,730 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7/16  | 07 | 0.4390<br>11,151 | 0.5638<br>14,321 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1/2   | 08 | 0.5015<br>12,738 | 0.6265<br>15,913 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9/16  | 09 | 0.5640<br>14,326 | 0.6892<br>17,506 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5/8   | 10 | 0.6265<br>15,913 | 0.8142<br>20,681 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11/16 | 11 | 0.6890<br>17,501 | 0.8767<br>22,268 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3/4   | 12 | 0.7515<br>19,088 | 0.9393<br>23,858 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7/8   | 14 | 0.8765<br>22,263 | 1.0645<br>27,038 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1     | 16 | 1.0015<br>25,438 | 1.1898<br>30,221 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 1/8 | 18 | 1.1265<br>28,613 | 1.3148<br>33,396 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 1/4 | 20 | 1.2515<br>31,788 | 1.4398<br>36,571 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 3/8 | 22 | 1.3765<br>34,963 | 1.5648<br>39,746 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 1/2 | 24 | 1.5015<br>38,138 | 1.7523<br>44,508 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 5/8 | 26 | 1.6265<br>41,313 | 1.8773<br>47,683 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 3/4 | 28 | 1.7515<br>44,488 | 2.0023<br>50,858 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2     | 32 | 2.0015<br>50,838 | 2.2523<br>57,208 |  |  |  |  |  |  |  |  |  |  |  |  |  |

## Designation system

|           |             |     |   |   |    |    |   |    |
|-----------|-------------|-----|---|---|----|----|---|----|
| Examples: | 13BAZ0406Y1 | 13B | A | Z | 04 | 06 |   | Y1 |
|           | 13BSZ1012C  | 13B | S | Z | 10 | 12 | C |    |
|           | 13BAZ2628Y3 | 13B | A | Z | 26 | 28 |   | Y3 |

|                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| <b>Basic designation</b> |                                                                   |
| <b>Material</b>          |                                                                   |
| S                        | Corrosion-resistant steel (CRES)                                  |
| A                        | Aluminium alloy                                                   |
| <b>Bore code</b>         |                                                                   |
| ...                      | Two digits, see <i>Nominal bore code (multiples of 1/16 inch)</i> |
| <b>Length code</b>       |                                                                   |
| ...                      | Two digits, see <i>Length code (multiples of 1/32 inch)</i>       |
| <b>Surface treatment</b> |                                                                   |
| No code                  | Passivated CRES or anodized aluminium                             |
| C                        | Cadmium plated on CRES                                            |
| J                        | Zinc-nickel plated on CRES                                        |
| <b>Oversize</b>          |                                                                   |
| No code                  | Standard outer diameter size                                      |
| Y1                       | 0.005 in oversized outer diameter <sup>1)</sup>                   |
| Y2                       | 0.010 in oversized outer diameter                                 |
| Y3                       | 0.015 in oversized outer diameter <sup>1)</sup>                   |
| Y4                       | 0.020 in oversized outer diameter                                 |

<sup>1)</sup> SKF option

## More specifications

|                          |     |
|--------------------------|-----|
| Material                 | 391 |
| Surface treatments       | 391 |
| Liners                   | 391 |
| Load carrying capability | 384 |
| Friction and torque      | 384 |
| Operating temperature    | 384 |
| Fits and tolerances      | 386 |
| Counterface surfaces     | 386 |
| Bearing handling         | 392 |

More options available than the standards offers.

## Customized journal bearings

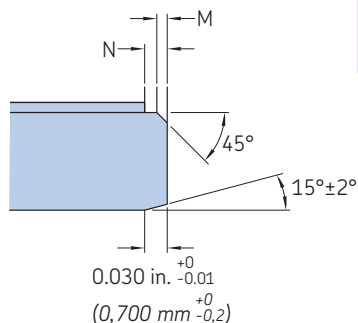
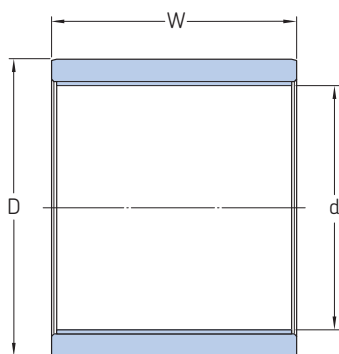
Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

| Length (W) 0/-0.01 0/-0,254 |       |      |       |       |       |       |       |       |       |      |       |       |       |       |       | Masses |            |                 |
|-----------------------------|-------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|--------|------------|-----------------|
| 3/4                         | 7/8   | 1    | 1 1/8 | 1 1/4 | 1 3/8 | 1 1/2 | 1 5/8 | 1 3/4 | 1 7/8 | 2    | 2 1/8 | 2 1/4 | 2 3/8 | 2 1/2 | 2 3/4 | 3      | CRES       | Aluminium alloy |
| 19,05                       | 22,23 | 25,4 | 28,58 | 31,75 | 34,93 | 38,1  | 41,28 | 44,45 | 47,63 | 50,8 | 53,98 | 57,15 | 60,33 | 63,5  | 69,85 | 76,2   | Per inch   | Per inch        |
| 24                          | 28    | 32   | 36    | 40    | 44    | 48    | 52    | 56    | 60    | 64   | 68    | 72    | 76    | 80    | 88    | 96     | length (W) | length (W)      |
| in/mm                       |       |      |       |       |       |       |       |       |       |      |       |       |       |       |       | lb/q   |            |                 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |        |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---------|--------|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.016   | 0.006  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 7,257   | 2,721  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.019   | 0.007  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 8,618   | 3,175  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.022   | 0.008  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 9,979   | 3,629  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.025   | 0.009  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 11,400  | 4,082  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.028   | 0.011  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12,700  | 4,989  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.031   | 0.012  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 14,061  | 5,443  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.056   | 0.021  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 25,401  | 9,525  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.06    | 0.022  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 27,215  | 9,979  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.065   | 0.024  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 29,483  | 10,886 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.075   | 0.028  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 34,019  | 12,700 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.084   | 0.031  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 38,102  | 14,061 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.094   | 0.035  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 42,638  | 15,876 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.103   | 0.038  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 46,720  | 17,236 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.113   | 0.041  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 51,256  | 18,597 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.171   | 0.062  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 77,564  | 28,123 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.183   | 0.067  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 83,007  | 30,391 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.196   | 0.071  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 88,904  | 32,205 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.222   | 0.081  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 100,697 | 36,741 |

## 4.7 Plain bearings (inch dimensions)

13E..Z..



|                                |                                                                      |
|--------------------------------|----------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2311                                                              |
| <b>Product standards</b>       | EN 4536-2 (Corrosion-resistant steel)<br>EN 4534-2 (Aluminium alloy) |
| <b>Standard materials</b>      |                                                                      |
| Corrosion-resistant steel:     | 17-4PH                                                               |
| Surface treatment:             | Passivated                                                           |
| Aluminium alloy:               | 2024                                                                 |
| Surface treatment:             | Sulfuric acid anodized                                               |
| Liner:                         | X1                                                                   |

| M         | N         |
|-----------|-----------|
| in/mm     |           |
| max. 0.02 | max. 0.03 |
| max. 0,5  | max. 0,7  |

| Nominal bore | Code | Dimensions |                                  | Length (W) |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
|--------------|------|------------|----------------------------------|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|              |      | d          | D                                | 0/-0.01    | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 | 0/-0.01 |
| Dia-meter    |      | 0/-0.0010  | CRES 0/-0.0005 (0/-0,013)        | 3,97       | 4,76    | 5,56    | 6,35    | 7,14    | 7,94    | 8,73    | 9,53    | 11,11   | 12,7    | 14,29   | 15,88   | 17,46   | 19,05   |         |         |
|              |      | 0/-0,0254  | Aluminium alloy ±0.0005 (±0,013) | 05         | 06      | 07      | 08      | 09      | 10      | 11      | 12      | 14      | 16      | 18      | 20      | 22      | 24      |         |         |
| in           |      | in/mm      |                                  | in/mm      |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |

|       |    |                  |                  |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
|-------|----|------------------|------------------|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|--|
| 1/4   | 04 | 0.2515<br>6,388  | 0.3760<br>9,550  |  |  |  |  |  |  |  |  |  | 1) |    |    |    |    |    |  |
| 5/16  | 05 | 0.3140<br>7,976  | 0.4386<br>11,140 |  |  |  |  |  |  |  |  |  | 1) | 1) |    |    |    |    |  |
| 3/8   | 06 | 0.3765<br>9,563  | 0.5012<br>12,730 |  |  |  |  |  |  |  |  |  |    |    | 1) | 1) |    |    |  |
| 7/16  | 07 | 0.4390<br>11,151 | 0.5638<br>14,321 |  |  |  |  |  |  |  |  |  |    |    |    | 1) | 1) |    |  |
| 1/2   | 08 | 0.5015<br>12,738 | 0.6265<br>15,913 |  |  |  |  |  |  |  |  |  |    |    |    |    |    | 1) |  |
| 9/16  | 09 | 0.5640<br>14,326 | 0.6892<br>17,506 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 5/8   | 10 | 0.6265<br>15,913 | 0.8142<br>20,681 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 11/16 | 11 | 0.6890<br>17,501 | 0.8767<br>22,268 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 3/4   | 12 | 0.7515<br>19,088 | 0.9393<br>23,858 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 7/8   | 14 | 0.8765<br>22,263 | 1.0645<br>27,038 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 1     | 16 | 1.0015<br>25,438 | 1.1898<br>30,221 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 1 1/8 | 18 | 1.1265<br>28,613 | 1.3148<br>33,396 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 1 1/4 | 20 | 1.2515<br>31,788 | 1.4398<br>36,571 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 1 3/8 | 22 | 1.3765<br>34,963 | 1.5648<br>39,746 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 1 1/2 | 24 | 1.5015<br>38,138 | 1.7523<br>44,508 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 1 5/8 | 26 | 1.6265<br>41,313 | 1.8773<br>47,683 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 1 3/4 | 28 | 1.7515<br>44,488 | 2.0023<br>50,858 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |
| 2     | 32 | 2.0015<br>50,838 | 2.2523<br>57,208 |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |  |

1) SKF option for corrosion-resistant steel bearings 2) SKF option



## Designation system

|           |             |     |   |   |    |    |   |    |
|-----------|-------------|-----|---|---|----|----|---|----|
| Examples: | 13EAZ0406Y1 | 13E | A | Z | 04 | 06 |   | Y1 |
|           | 13ESZ1636C  | 13E | S | Z | 16 | 36 | C |    |
|           | 13EAZ0406Y2 | 13E | A | Z | 04 | 06 |   | Y2 |

|                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| <b>Basic designation</b> |                                                                   |
| <b>Material</b>          |                                                                   |
| S                        | Corrosion-resistant steel (CRES)                                  |
| A                        | Aluminium alloy                                                   |
| <b>Bore code</b>         |                                                                   |
| ...                      | Two digits, see <i>Nominal bore code (multiples of 1/16 inch)</i> |
| <b>Length code</b>       |                                                                   |
| ...                      | Two digits, see <i>Length code (multiples of 1/32 inch)</i>       |
| <b>Surface treatment</b> |                                                                   |
| No code                  | Passivated CRES or anodized aluminium                             |
| C <sup>1)</sup>          | Cadmium plated on CRES                                            |
| J <sup>1)</sup>          | Zinc-nickel plated on CRES                                        |
| <b>Oversize</b>          |                                                                   |
| No code                  | Standard outer diameter size                                      |
| Y1 <sup>1)</sup>         | 0.005 in oversized outer diameter                                 |
| Y2 <sup>1)</sup>         | 0.010 in oversized outer diameter                                 |

<sup>1)</sup> SKF option

## More specifications

|                          |     |
|--------------------------|-----|
| Material                 | 391 |
| Surface treatments       | 391 |
| Liners                   | 391 |
| Load carrying capability | 384 |
| Friction and torque      | 384 |
| Operating temperature    | 384 |
| Fits and tolerances      | 386 |
| Counterface surfaces     | 386 |
| Bearing handling         | 392 |

More options and sizes available than the standards offers, see 1) and 2).

## Customized journal bearings

Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

### Length (W) 0/-0.01 0/-0,254

|       |      |       |       |       |       |       |       |       |      |       |       |       |       |       |      |
|-------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|
| 7/8   | 1    | 1 1/8 | 1 1/4 | 1 3/8 | 1 1/2 | 1 5/8 | 1 3/4 | 1 7/8 | 2    | 2 1/8 | 2 1/4 | 2 3/8 | 2 1/2 | 2 3/4 | 3    |
| 22,23 | 25,4 | 28,58 | 31,75 | 34,93 | 38,1  | 41,28 | 44,45 | 47,63 | 50,8 | 53,98 | 57,15 | 60,33 | 63,5  | 69,85 | 76,2 |
| 28    | 32   | 36    | 40    | 44    | 48    | 52    | 56    | 60    | 64   | 68    | 72    | 76    | 80    | 88    | 96   |

### Masses

|                     |                     |
|---------------------|---------------------|
| CRES                | Aluminium alloy     |
| Per inch length (W) | Per inch length (W) |

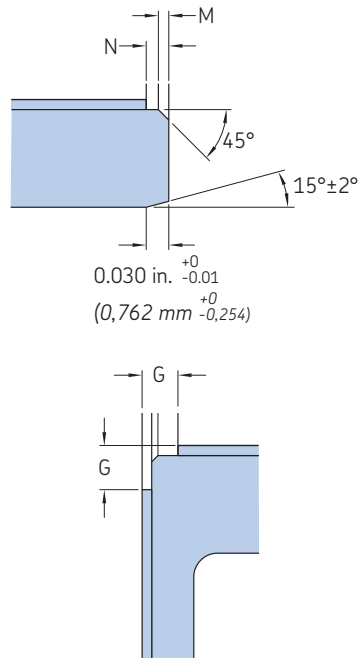
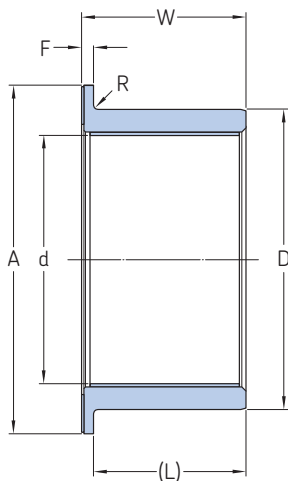
in/mm

lb/g

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |         |        |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------|--------|
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 0.017   | 0.006  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 7,842   | 2,803  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 0.021   | 0.007  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 9,414   | 3,365  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 0.024   | 0.009  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 10,990  | 3,928  |
| 1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 0.028   | 0.10   |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 12,571  | 4,493  |
| 1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 0.031   | 0.011  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 14,164  | 5,062  |
| 1) | 1) | 2) |    |    |    |    |    |    |    |    |    |    |    |    |    | 0.035   | 0.012  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 15,762  | 5,634  |
|    | 1) | 1) | 2) | 2) |    |    |    |    |    |    |    |    |    |    |    | 0.60    | 0.021  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 27,101  | 9,686  |
|    |    | 1) | 1) | 2) | 2) | 2) |    |    |    |    |    |    |    |    |    | 0.065   | 0.023  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 29,447  | 10,525 |
|    |    | 1) | 1) | 1) | 2) | 2) |    |    |    |    |    |    |    |    |    | 0.70    | 0.025  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 31,821  | 11,373 |
|    |    |    |    | 1) | 1) | 1) |    |    |    |    |    |    |    |    |    | 0.081   | 0.029  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 36,571  | 13,071 |
|    |    |    |    |    | 1) | 1) | 1) | 1) |    |    |    |    |    |    |    | 0.091   | 0.033  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 41,358  | 14,782 |
|    |    |    |    |    |    | 1) | 1) | 1) |    |    |    |    |    |    |    | 0.102   | 0.036  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 46,079  | 16,470 |
|    |    |    |    |    |    |    |    | 1) | 1) | 1) |    |    |    |    |    | 0.112   | 0.40   |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 50,800  | 18,157 |
|    |    |    |    |    |    |    |    |    | 1) | 1) |    |    |    |    |    | 0.122   | 0.044  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 55,520  | 19,844 |
|    |    |    |    |    |    |    |    |    |    |    | 1) | 1) | 1) | 1) |    | 0.180   | 0.064  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 81,692  | 29,198 |
|    |    |    |    |    |    |    |    |    |    |    |    | 1) | 1) | 1) | 1) | 0.194   | 0.069  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 87,971  | 31,443 |
|    |    |    |    |    |    |    |    |    |    |    |    |    | 1) | 1) | 1) | 0.208   | 0.074  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 94,250  | 33,687 |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1) | 0.235   | 0.084  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 106,807 | 38,175 |

## 4.8 Flanged bearings (inch dimensions)

13A..F.., K..F..P



**Technical specification** AS 8943

**Product standards** NSA 8147 (Corrosion-resistant steel)  
NSA 8148 (Aluminium alloy)

### Standard materials

Corrosion-resistant steel:

13A..F.. and K..F..P: S.80

Aluminium alloy:

13A..F.. and K..F..P: 2618

Surface treatment: Sulfuric acid anodized

Liner:

13A..F..: X1  
K..F..P: Fiberslip

| Nominal bore code | M                        | N                        | R                         | G                |
|-------------------|--------------------------|--------------------------|---------------------------|------------------|
| –                 | in/mm                    |                          |                           |                  |
| ≤ 12              | max. 0.010<br>max. 0,254 | max. 0.025<br>max. 0,635 | 0.03–0.010<br>0,762–0,254 | ≈0.020<br>≈0,508 |
| ≥ 14              | max. 0.020<br>max. 0,508 | max. 0.025<br>max. 0,635 | 0.03–0.010<br>0,762–0,254 | ≈0.040<br>≈1,016 |

| Nominal bore |      | Dimensions |       |       |       |          |          | Length (W) −0.005/−0.015 (−0,127/−0,381) |        |      |      |      |       |      |  |
|--------------|------|------------|-------|-------|-------|----------|----------|------------------------------------------|--------|------|------|------|-------|------|--|
| Dia-meter    | Code | d          |       | D     |       | F        | A        | 5/32                                     | 3/16   | 1/4  | 5/16 | 3/8  | 7/16  | 1/2  |  |
|              |      | Upper      | Lower | Upper | Lower | 0/−0.005 | 0/−0.010 | 3.9688                                   | 4.7625 | 6.35 | 7.94 | 9.53 | 11.11 | 12.7 |  |
|              |      |            |       |       |       | 0/−0.127 | 0/−0.254 | 02 <sup>4)</sup>                         | 03     | 04   | 05   | 06   | 07    | 08   |  |
| in           |      | in/mm      |       |       |       |          |          | in/mm                                    |        |      |      |      |       |      |  |

|       |    |                  |                  |                  |                  |              |                |  |    |    |  |  |    |    |    |  |
|-------|----|------------------|------------------|------------------|------------------|--------------|----------------|--|----|----|--|--|----|----|----|--|
| 1/4   | 04 | 0.2512<br>6,380  | 0.2503<br>6,358  | 0.3760<br>9,550  | 0.3755<br>9,538  | 0.062<br>1,6 | 0.500<br>12,70 |  | 3) | 1) |  |  |    |    |    |  |
| 5/16  | 05 | 0.3139<br>7,973  | 0.3130<br>7,950  | 0.4386<br>11,140 | 0.4381<br>11,128 | 0.062<br>1,6 | 0.562<br>14,28 |  | 3) | 1) |  |  |    |    | 3) |  |
| 3/8   | 06 | 0.3765<br>9,563  | 0.3756<br>9,540  | 0.5011<br>12,728 | 0.5006<br>12,715 | 0.062<br>1,6 | 0.625<br>15,87 |  | 1) | 1) |  |  |    |    | 3) |  |
| 7/16  | 07 | 0.440<br>11,188  | 0.4395<br>11,164 | 0.627<br>15,924  | 0.626<br>15,900  | 0.062<br>1,6 | 0.752<br>19,10 |  |    | 1) |  |  |    |    | 3) |  |
| 1/2   | 08 | 0.5016<br>12,741 | 0.5006<br>12,715 | 0.6888<br>17,496 | 0.6883<br>17,483 | 0.062<br>1,6 | 0.875<br>22,22 |  |    | 1) |  |  |    |    | 3) |  |
| 5/8   | 10 | 0.6267<br>15,918 | 0.6257<br>15,893 | 0.8139<br>20,673 | 0.8134<br>20,660 | 0.062<br>1,6 | 1.000<br>25,40 |  |    | 1) |  |  |    |    | 3) |  |
| 3/4   | 12 | 0.7520<br>19,101 | 0.7508<br>19,070 | 0.9389<br>23,848 | 0.9384<br>23,835 | 0.062<br>1,6 | 1.125<br>28,57 |  |    | 1) |  |  |    |    | 3) |  |
| 7/8   | 14 | 0.8771<br>22,278 | 0.8759<br>22,248 | 1.0640<br>27,026 | 1.0635<br>27,013 | 0.062<br>1,6 | 1.250<br>31,75 |  |    | 1) |  |  |    |    | 3) |  |
| 1     | 16 | 1.0022<br>25,456 | 1.0010<br>25,425 | 1.1890<br>30,201 | 1.1885<br>30,188 | 0.062<br>1,6 | 1.375<br>34,92 |  |    | 1) |  |  |    |    | 3) |  |
| 1 1/8 | 18 | 1.1275<br>28,639 | 1.1263<br>28,608 | 1.3143<br>33,383 | 1.3137<br>33,368 | 0.094<br>2,4 | 1.625<br>41,27 |  |    |    |  |  | 1) |    | 3) |  |
| 1 1/4 | 20 | 1.2528<br>31,821 | 1.2512<br>31,780 | 1.5019<br>38,148 | 1.5013<br>38,133 | 0.094<br>2,4 | 1.750<br>44,45 |  |    |    |  |  | 1) |    | 3) |  |
| 1 3/8 | 22 | 1.3779<br>34,999 | 1.3763<br>34,958 | 1.6269<br>41,323 | 1.6263<br>41,308 | 0.094<br>2,4 | 1.875<br>47,62 |  |    |    |  |  | 1) |    | 3) |  |
| 1 1/2 | 24 | 1.5029<br>38,174 | 1.5013<br>38,133 | 1.7519<br>44,498 | 1.7513<br>44,483 | 0.094<br>2,4 | 2.000<br>50,80 |  |    |    |  |  | 1) |    | 3) |  |
| 1 3/4 | 28 | 1.7533<br>44,534 | 1.7517<br>44,493 | 2.0023<br>50,858 | 2.0016<br>50,841 | 0.094<br>2,4 | 2.250<br>57,15 |  |    |    |  |  |    | 1) | 3) |  |
| 2     | 32 | 2.0035<br>50,889 | 2.0017<br>50,843 | 2.2523<br>57,208 | 2.2516<br>57,191 | 0.094<br>2,4 | 2.500<br>63,50 |  |    |    |  |  |    | 1) | 3) |  |

<sup>1)</sup> SKF option for corrosion-resistant steel bearings

<sup>2)</sup> SKF option for aluminium alloy bearings

<sup>3)</sup> SKF option

<sup>4)</sup> Code 02 corresponds to a length of 2.5/16 in



## Designation system

Examples: 13AAF0404 13ASF1012C KAF0404PY2

### Basic designation

#### Material

**S** Corrosion-resistant steel (CRES)  
**A** Aluminium alloy

#### Bore code

... Two digits, see *Nominal bore code (multiples of 1/16 inch)*

#### Length code

... Two digits, see *Length code (multiples of 1/16 inch)*

#### Surface treatment

**No code** Passivated CRES or anodized aluminium  
**C<sup>1)</sup>** Cadmium plated on CRES  
**J<sup>1)</sup>** Zinc-nickel plated on CRES

#### Oversize

**No code** Standard outer diameter size  
**Y1<sup>1)</sup>** 0.005 in oversized outer diameter  
**Y2<sup>1)</sup>** 0.010 in oversized outer diameter

<sup>1)</sup> SKF option

## More specifications

|                                    |     |
|------------------------------------|-----|
| Material . . . . .                 | 391 |
| Surface treatments . . . . .       | 391 |
| Liners . . . . .                   | 391 |
| Load carrying capability . . . . . | 384 |
| Friction and torque . . . . .      | 384 |
| Operating temperature . . . . .    | 384 |
| Fits and tolerances . . . . .      | 386 |
| Counterface surfaces . . . . .     | 386 |
| Bearing handling . . . . .         | 392 |

More options and sizes available than the standards offers, see 1) to 3).

## Customized journal bearings

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4.8



### Length (W) –0.005/–0.015 (–0.127/–0.381)

|           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 5/8       | 3/4       | 13/16     | 7/8       | 1         | 1 1/4     | 1 1/2     | 2         | 2 1/2     | 3         |
| 15,88     | 19,05     | 20,64     | 22,23     | 25,4      | 31,75     | 38,1      | 50,8      | 63,5      | 76,2      |
| <b>10</b> | <b>12</b> | <b>13</b> | <b>14</b> | <b>16</b> | <b>20</b> | <b>24</b> | <b>32</b> | <b>40</b> | <b>48</b> |

in/mm

### Masses

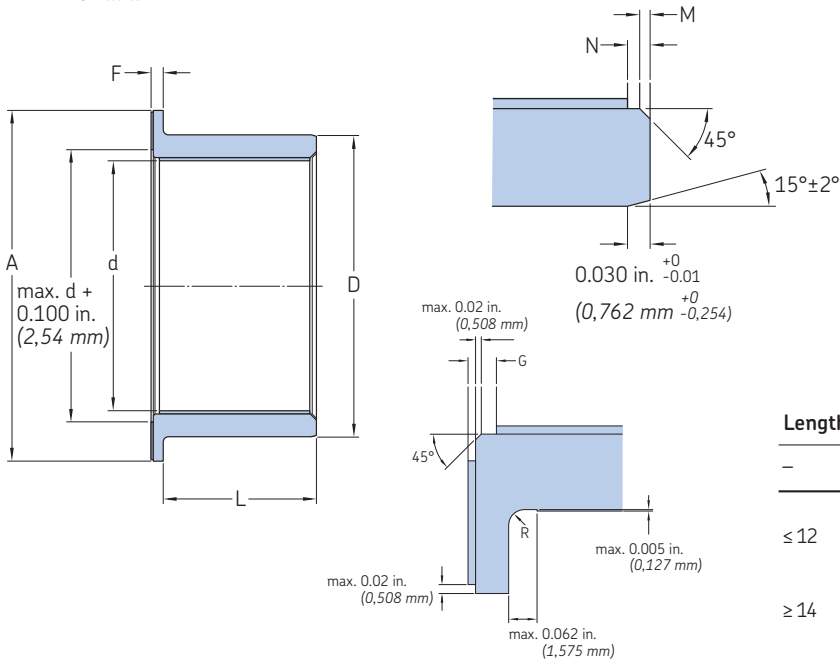
| CRES                | Flange | Aluminium alloy     | Flange |
|---------------------|--------|---------------------|--------|
| Per inch length (L) |        | Per inch length (L) |        |

lb/g

|  |  |    |    |    |    |  |    |  |  |         |        |        |        |
|--|--|----|----|----|----|--|----|--|--|---------|--------|--------|--------|
|  |  |    |    |    |    |  |    |  |  | 0.0132  | 0.0017 | 0.0077 | 0.0006 |
|  |  |    |    |    |    |  |    |  |  | 5,987   | 0,771  | 3,493  | 0,272  |
|  |  |    |    |    |    |  |    |  |  | 0.0220  | 0.0020 | 0.0088 | 0.0007 |
|  |  |    |    |    |    |  |    |  |  | 9,979   | 0,907  | 3,992  | 0,317  |
|  |  |    |    |    |    |  |    |  |  | 0.0264  | 0.0022 | 0.0099 | 0.0008 |
|  |  |    |    |    |    |  |    |  |  | 11,975  | 0,998  | 4,491  | 0,363  |
|  |  |    |    |    |    |  |    |  |  | 0.0340  | 0.0028 | 0.0122 | 0.0010 |
|  |  |    |    |    |    |  |    |  |  | 15,422  | 1,270  | 5,534  | 0,454  |
|  |  | 3) | 3) | 1) |    |  |    |  |  | 0.0550  | 0.0048 | 0.0209 | 0.0017 |
|  |  |    |    |    |    |  |    |  |  | 24,948  | 2,177  | 9,480  | 0,771  |
|  |  | 2) | 3) |    | 1) |  |    |  |  | 0.0660  | 0.0056 | 0.0263 | 0.0020 |
|  |  |    |    |    |    |  |    |  |  | 29,937  | 2,540  | 11,929 | 0,907  |
|  |  | 3) | 3) |    |    |  |    |  |  | 0.0770  | 0.0063 | 0.0297 | 0.0023 |
|  |  |    |    |    |    |  |    |  |  | 34,927  | 2,858  | 13,472 | 1,043  |
|  |  | 3) | 3) |    | 1) |  |    |  |  | 0.0825  | 0.0071 | 0.0330 | 0.0026 |
|  |  |    |    |    |    |  |    |  |  | 37,421  | 3,220  | 14,969 | 1,179  |
|  |  | 3) | 3) |    |    |  |    |  |  | 0.0924  | 0.0078 | 0.0374 | 0.0028 |
|  |  |    |    |    |    |  |    |  |  | 41,912  | 3,538  | 16,964 | 1,270  |
|  |  | 3) | 3) |    |    |  | 3) |  |  | 0.1023  | 0.0233 | 0.0418 | 0.0084 |
|  |  |    |    |    |    |  |    |  |  | 46,402  | 10,569 | 18,960 | 3,810  |
|  |  | 3) | 2) |    |    |  | 2) |  |  | 0.1606  | 0.0204 | 0.0638 | 0.0074 |
|  |  |    |    |    |    |  |    |  |  | 72,847  | 9,253  | 28,939 | 3,357  |
|  |  | 3) | 3) |    |    |  |    |  |  | 0.1760  | 0.0220 | 0.0693 | 0.0079 |
|  |  |    |    |    |    |  |    |  |  | 79,832  | 9,979  | 31,434 | 3,583  |
|  |  | 3) | 3) |    |    |  |    |  |  | 0.1903  | 0.0236 | 0.0748 | 0.0085 |
|  |  |    |    |    |    |  |    |  |  | 86,319  | 10,705 | 33,929 | 3,855  |
|  |  | 3) | 3) |    |    |  |    |  |  | 0.2200  | 0.0267 | 0.0858 | 0.0096 |
|  |  |    |    |    |    |  |    |  |  | 99,790  | 12,111 | 38,918 | 4,354  |
|  |  | 3) | 3) |    |    |  |    |  |  | 0.2475  | 0.0299 | 0.0979 | 0.0108 |
|  |  |    |    |    |    |  |    |  |  | 112,264 | 13,562 | 44,407 | 4,899  |

## 4.9 Flanged bearings (inch dimensions)

13B..F..



|                            |                        |
|----------------------------|------------------------|
| Technical specification    | AS 81934               |
| Product standards          | AS 81934/2             |
| Standard materials         |                        |
| Corrosion-resistant steel: | 17-4PH                 |
| Surface treatment:         | Passivated             |
| Aluminium alloy:           | 2024                   |
| Surface treatment:         | Sulfuric acid anodized |
| Liner:                     | X1                     |

| Length code | M                        | N                        | R                            | G                        |
|-------------|--------------------------|--------------------------|------------------------------|--------------------------|
| –           | in/mm                    |                          |                              |                          |
| ≤ 12        | max. 0.005<br>max. 0,127 | max. 0.010<br>max. 0,254 | 0.010 ±0.005<br>0,254 ±0,127 | max. 0.055<br>max. 1,397 |
| ≥ 14        | max. 0.015<br>max. 0,381 | max. 0.025<br>max. 0,635 | 0.010 ±0.005<br>0,254 ±0,127 | max. 0.055<br>max. 1,397 |

| Nominal bore |      | Dimensions |                         |          |          | Length (L) 0/-0.01 0/-0,254 |      |      |      |      |      |       |      |       |      |       |       |  |
|--------------|------|------------|-------------------------|----------|----------|-----------------------------|------|------|------|------|------|-------|------|-------|------|-------|-------|--|
|              |      | d          | D                       | F        | A        | 5/32                        | 3/16 | 7/32 | 1/4  | 9/32 | 5/16 | 11/32 | 3/8  | 7/16  | 1/2  | 9/16  | 5/8   |  |
| Dia-meter    | Code | 0/-0.0010  | 0/-0.0005 <sup>1)</sup> | 0/-0.005 | 0/-0.020 | 3,97                        | 4,76 | 5,56 | 6,35 | 7,14 | 7,94 | 8,73  | 9,53 | 11,11 | 12,7 | 14,29 | 15,88 |  |
|              |      | 0/-0,0254  | 0/-0,013                | 0/-0,127 | 0/-0,508 | 05                          | 06   | 07   | 08   | 09   | 10   | 11    | 12   | 14    | 16   | 18    | 20    |  |

| in    |           | in/mm            |                  |                 |                | in/mm |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------|-----------|------------------|------------------|-----------------|----------------|-------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 1/4   | <b>04</b> | 0.2515<br>6,388  | 0.3760<br>9,550  | 0.0625<br>1,587 | 0.750<br>19,05 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5/16  | <b>05</b> | 0.3140<br>7,976  | 0.4386<br>11,140 | 0.0625<br>1,587 | 0.812<br>20,62 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3/8   | <b>06</b> | 0.3765<br>9,563  | 0.5012<br>12,730 | 0.0625<br>1,587 | 0.875<br>22,22 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7/16  | <b>07</b> | 0.4390<br>11,151 | 0.5638<br>14,321 | 0.0625<br>1,587 | 0.937<br>23,80 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1/2   | <b>08</b> | 0.5015<br>12,738 | 0.6265<br>15,913 | 0.0625<br>1,587 | 1.000<br>25,40 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9/16  | <b>09</b> | 0.5640<br>14,326 | 0.6892<br>17,506 | 0.0625<br>1,587 | 1.125<br>28,57 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5/8   | <b>10</b> | 0.6265<br>15,913 | 0.8142<br>20,681 | 0.0625<br>1,587 | 1.250<br>31,75 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11/16 | <b>11</b> | 0.6890<br>17,501 | 0.8767<br>22,268 | 0.0625<br>1,587 | 1.375<br>34,92 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3/4   | <b>12</b> | 0.7515<br>19,088 | 0.9393<br>23,858 | 0.0625<br>1,587 | 1.500<br>38,10 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7/8   | <b>14</b> | 0.8765<br>22,263 | 1.0645<br>27,038 | 0.0625<br>1,587 | 1.625<br>41,27 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1     | <b>16</b> | 1.0015<br>25,438 | 1.1898<br>30,221 | 0.0625<br>1,587 | 1.750<br>44,45 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 1/8 | <b>18</b> | 1.1265<br>28,613 | 1.3148<br>33,396 | 0.0937<br>2,380 | 1.875<br>47,62 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 1/4 | <b>20</b> | 1.2515<br>31,788 | 1.4398<br>36,571 | 0.0937<br>2,380 | 2.000<br>50,80 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 3/8 | <b>22</b> | 1.3765<br>34,963 | 1.5648<br>39,746 | 0.0937<br>2,380 | 2.125<br>53,97 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 1/2 | <b>24</b> | 1.5015<br>38,138 | 1.7523<br>44,508 | 0.0937<br>2,380 | 2.250<br>57,15 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 5/8 | <b>26</b> | 1.6265<br>41,313 | 1.8773<br>47,683 | 0.0937<br>2,380 | 2.375<br>60,32 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 3/4 | <b>28</b> | 1.7515<br>44,488 | 2.0023<br>50,858 | 0.0937<br>2,380 | 2.500<br>63,50 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2     | <b>32</b> | 2.0015<br>50,838 | 2.2523<br>57,208 | 0.0937<br>2,380 | 2.750<br>69,85 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |

<sup>1)</sup> These values apply for corrosion-resistant steel bearings. For aluminium alloy bearings, tolerance is ±0.0005 in (±0,0013 mm)

## Designation system

|           |             |     |   |   |    |    |   |    |
|-----------|-------------|-----|---|---|----|----|---|----|
| Examples: | 13BAF0408Y1 | 13B | A | F | 04 | 08 |   | Y1 |
|           | 13BSF1012C  | 13B | S | F | 10 | 12 | C |    |
|           | 13BAF0408Y2 | 13B | A | F | 04 | 08 |   | Y2 |

### Basic designation

|                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| <b>Material</b>          |                                                                   |
| S                        | Corrosion-resistant steel (CRES)                                  |
| A                        | Aluminium alloy                                                   |
| <b>Bore code</b>         |                                                                   |
| ...                      | Two digits, see <i>Nominal bore code (multiples of 1/16 inch)</i> |
| <b>Length code</b>       |                                                                   |
| ...                      | Two digits, see <i>Length code (multiples of 1/32 inch)</i>       |
| <b>Surface treatment</b> |                                                                   |
| No code                  | Passivated CRES or anodized aluminium                             |
| C                        | Cadmium plated on CRES                                            |
| J                        | Zinc-nickel plated on CRES                                        |
| <b>Oversize</b>          |                                                                   |
| No code                  | Standard outer diameter size                                      |
| Y1 <sup>1)</sup>         | 0.005 in oversized outer diameter                                 |
| Y2                       | 0.010 in oversized outer diameter                                 |
| Y3 <sup>1)</sup>         | 0.015 in oversized outer diameter                                 |
| Y4                       | 0.020 in oversized outer diameter                                 |

<sup>1)</sup> SKF option

## More specifications

|                                    |     |
|------------------------------------|-----|
| Material . . . . .                 | 391 |
| Surface treatments . . . . .       | 391 |
| Liners . . . . .                   | 391 |
| Load carrying capability . . . . . | 384 |
| Friction and torque . . . . .      | 384 |
| Operating temperature . . . . .    | 384 |
| Fits and tolerances . . . . .      | 386 |
| Counterface surfaces . . . . .     | 386 |
| Bearing handling . . . . .         | 392 |

More options available than the standards offers.

## Customized journal bearings

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4.9



### Length (L) 0/-0.01 0/-0.254

|       |       |       |      |       |       |       |       |       |       |       |      |       |       |       |       |       |      |
|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|
| 11/16 | 3/4   | 7/8   | 1    | 1 1/8 | 1 1/4 | 1 3/8 | 1 1/2 | 1 5/8 | 1 3/4 | 1 7/8 | 2    | 2 1/8 | 2 1/4 | 2 3/8 | 2 1/2 | 2 3/4 | 3    |
| 17,46 | 19,05 | 22,23 | 25,4 | 28,58 | 31,75 | 34,93 | 38,1  | 41,28 | 44,45 | 47,63 | 50,8 | 53,98 | 57,15 | 60,33 | 63,5  | 66,67 | 70,0 |
| 22    | 24    | 28    | 32   | 36    | 40    | 44    | 48    | 52    | 56    | 60    | 64   | 68    | 72    | 76    | 80    | 88    | 96   |

in/mm

### Masses

| CRES                | Aluminium alloy     |
|---------------------|---------------------|
| Per inch length (L) | Per inch length (L) |

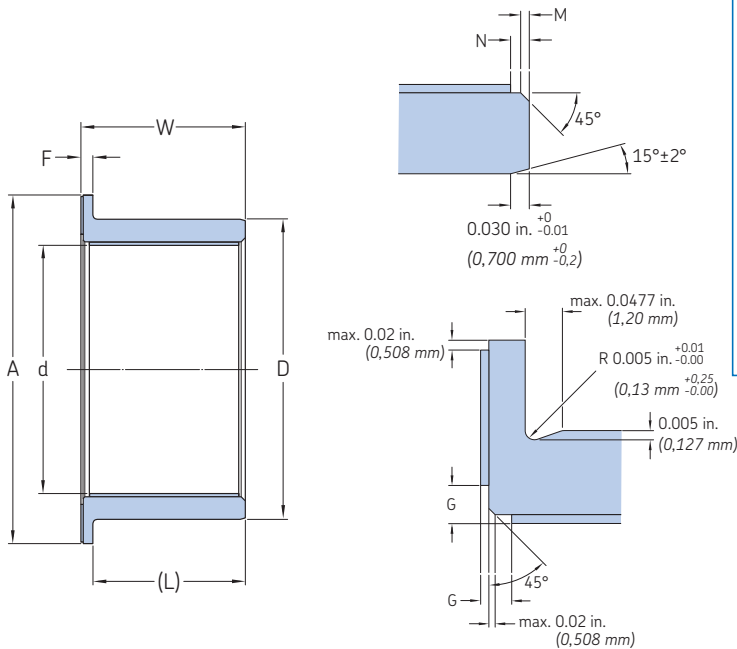
lb/g

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |        |        |        |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---------|--------|--------|--------|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.017   | 0.007  | 0.006  | 0.003  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 7,711   | 3,175  | 2,722  | 1,361  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.022   | 0.007  | 0.008  | 0.003  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 9,979   | 3,175  | 3,629  | 1,361  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.025   | 0.007  | 0.009  | 0.003  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 11,340  | 3,175  | 4,082  | 1,361  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.028   | 0.008  | 0.010  | 0.003  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12,701  | 3,629  | 4,536  | 1,361  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.031   | 0.010  | 0.011  | 0.004  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 14,061  | 4,536  | 4,989  | 1,814  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.036   | 0.011  | 0.013  | 0.004  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 16,329  | 4,989  | 5,897  | 1,814  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.061   | 0.014  | 0.022  | 0.005  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 27,669  | 6,350  | 9,979  | 2,268  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.064   | 0.020  | 0.023  | 0.007  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 29,030  | 9,072  | 10,433 | 3,175  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.070   | 0.023  | 0.025  | 0.009  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 31,751  | 10,433 | 11,340 | 4,082  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.080   | 0.025  | 0.029  | 0.009  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 36,287  | 11,340 | 13,154 | 4,082  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.091   | 0.027  | 0.033  | 0.010  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 41,277  | 12,247 | 14,968 | 4,536  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.101   | 0.041  | 0.037  | 0.014  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 45,813  | 18,597 | 16,783 | 6,350  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.111   | 0.050  | 0.040  | 0.018  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 50,349  | 22,680 | 18,144 | 8,165  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.122   | 0.053  | 0.044  | 0.019  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 55,338  | 24,040 | 19,958 | 8,618  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.179   | 0.054  | 0.065  | 0.019  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 81,193  | 24,494 | 29,484 | 8,618  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.193   | 0.056  | 0.070  | 0.020  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 87,543  | 25,401 | 31,751 | 9,072  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.207   | 0.064  | 0.075  | 0.023  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 93,894  | 29,030 | 34,019 | 10,433 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.234   | 0.072  | 0.085  | 0.026  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 106,141 | 32,659 | 38,555 | 11,793 |

## 4.10 Flanged bearings, code U (inch dimensions)

13E..F..

For code R, see page 424



|                                |                                                                      |
|--------------------------------|----------------------------------------------------------------------|
| <b>Technical specification</b> | EN 2311                                                              |
| <b>Product standards</b>       | EN 4537-2 (Corrosion-resistant steel)<br>EN 4535-2 (Aluminium alloy) |
| <b>Standard materials</b>      |                                                                      |
| Corrosion-resistant steel:     | 17-4PH                                                               |
| Surface treatment:             | Passivated                                                           |
| Aluminium alloy:               | 2024                                                                 |
| Surface treatment:             | Sulfuric acid anodized                                               |
| Liner:                         | X1                                                                   |

| Nominal bore code | M                     | N                     | G                       |
|-------------------|-----------------------|-----------------------|-------------------------|
| –                 | in/mm                 |                       |                         |
| ≤ 12              | max. 0.02<br>max. 0,5 | max. 0.03<br>max. 0,7 | max. 0.028<br>max. 0,70 |
| ≥ 14              | max. 0.02<br>max. 0,5 | max. 0.03<br>max. 0,7 | max. 0.039<br>max. 1,00 |

| Nominal bore | Code | Dimensions |                         |          |            | Length (W) $-0.004/-0.016$ $-0.10/-0.40$ |      |      |      |      |       |      |       |      |       |       |       |       |  |
|--------------|------|------------|-------------------------|----------|------------|------------------------------------------|------|------|------|------|-------|------|-------|------|-------|-------|-------|-------|--|
|              |      | d          | D                       | F        | A (Code U) | 3/16                                     | 7/32 | 1/4  | 9/32 | 5/16 | 11/32 | 3/8  | 7/16  | 1/2  | 9/16  | 5/8   | 11/16 | 3/4   |  |
| Dia-meter    |      | 0/-0.0010  | 0/-0.0005 <sup>3)</sup> | 0/-0.005 | 0/-0.020   | 4,76                                     | 5,56 | 6,35 | 7,14 | 7,94 | 8,73  | 9,53 | 11,11 | 12,7 | 14,29 | 15,88 | 17,46 | 19,05 |  |
|              |      | 0/-0,0254  | 0/-0,013                | 0/-0,127 | 0/-0,508   | 06                                       | 07   | 08   | 09   | 10   | 11    | 12   | 14    | 16   | 18    | 20    | 22    | 24    |  |
| in           |      | in/mm      |                         |          |            | in/mm                                    |      |      |      |      |       |      |       |      |       |       |       |       |  |

|       |           |                  |                  |                 |                  |  |  |  |  |  |  |  |  |    |    |    |    |    |
|-------|-----------|------------------|------------------|-----------------|------------------|--|--|--|--|--|--|--|--|----|----|----|----|----|
| 1/4   | <b>04</b> | 0.2515<br>6,388  | 0.3760<br>9,550  | 0.0625<br>1,587 | 0.7500<br>19,050 |  |  |  |  |  |  |  |  | 1) | 1) |    |    |    |
| 5/16  | <b>05</b> | 0.3140<br>7,976  | 0.4386<br>11,140 | 0.0625<br>1,587 | 0.8130<br>20,650 |  |  |  |  |  |  |  |  |    | 1) | 1) |    |    |
| 3/8   | <b>06</b> | 0.3765<br>9,563  | 0.5012<br>12,730 | 0.0625<br>1,587 | 0.8750<br>22,225 |  |  |  |  |  |  |  |  |    |    | 1) | 1) | 1) |
| 7/16  | <b>07</b> | 0.4390<br>11,151 | 0.5638<br>14,321 | 0.0625<br>1,587 | 0.9380<br>23,825 |  |  |  |  |  |  |  |  |    |    |    | 1) | 1) |
| 1/2   | <b>08</b> | 0.5015<br>12,738 | 0.6265<br>15,913 | 0.0625<br>1,587 | 1.0000<br>25,400 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 9/16  | <b>09</b> | 0.5640<br>14,326 | 0.6892<br>17,506 | 0.0625<br>1,587 | 1.1250<br>28,575 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 5/8   | <b>10</b> | 0.6265<br>15,913 | 0.8142<br>20,681 | 0.0625<br>1,587 | 1.2500<br>31,750 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 11/16 | <b>11</b> | 0.6890<br>17,501 | 0.8767<br>22,268 | 0.0625<br>1,587 | 1.3750<br>34,924 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 3/4   | <b>12</b> | 0.7515<br>19,088 | 0.9393<br>23,858 | 0.0625<br>1,587 | 1.5000<br>38,099 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 7/8   | <b>14</b> | 0.8765<br>22,263 | 1.0645<br>27,038 | 0.0625<br>1,587 | 1.6250<br>41,274 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 1     | <b>16</b> | 1.0015<br>25,438 | 1.1898<br>30,221 | 0.0625<br>1,587 | 1.7500<br>44,449 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 1 1/8 | <b>18</b> | 1.1265<br>28,613 | 1.3148<br>33,396 | 0.094<br>2,390  | 1.8750<br>47,624 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 1 1/4 | <b>20</b> | 1.2515<br>31,788 | 1.4398<br>36,571 | 0.094<br>2,390  | 2.0000<br>50,799 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 1 3/8 | <b>22</b> | 1.3765<br>34,963 | 1.5648<br>39,746 | 0.094<br>2,390  | 2.1250<br>53,974 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 1 1/2 | <b>24</b> | 1.5015<br>38,138 | 1.7523<br>44,508 | 0.094<br>2,390  | 2.2500<br>57,149 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 1 5/8 | <b>26</b> | 1.6265<br>41,313 | 1.8773<br>47,683 | 0.094<br>2,390  | 2.3750<br>60,324 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 1 3/4 | <b>28</b> | 1.7515<br>44,488 | 2.0023<br>50,858 | 0.094<br>2,390  | 2.5000<br>63,499 |  |  |  |  |  |  |  |  |    |    |    |    |    |
| 2     | <b>32</b> | 2.0015<br>50,838 | 2.2523<br>57,208 | 0.094<br>2,390  | 2.7500<br>69,850 |  |  |  |  |  |  |  |  |    |    |    |    |    |

1) SKF option for corrosion-resistant steel bearings 2) SKF option

3) These values apply for corrosion-resistant steel bearings. For aluminium alloy bearings, tolerance is ±0.0005 in (±0,0013 mm)

|           |              |     |   |   |    |    |   |    |
|-----------|--------------|-----|---|---|----|----|---|----|
| Examples: | 13EAF0406UY1 | 13E | A | F | 04 | 06 | U | Y1 |
|           | 13EAF0406R   | 13E | A | F | 04 | 06 | R |    |
|           | 13ESF1636UY2 | 13E | S | F | 16 | 36 | U | Y2 |

|                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| <b>Material</b>          |                                                                   |
| <b>S</b>                 | Corrosion-resistant steel (CRES)                                  |
| <b>A</b>                 | Aluminium alloy                                                   |
| <b>Bore code</b>         |                                                                   |
| <b>...</b>               | Two digits, see <i>Nominal bore code (multiples of 1/16 inch)</i> |
| <b>Length code</b>       |                                                                   |
| <b>...</b>               | Two digits, see <i>Length code (multiples of 1/32 inch)</i>       |
| <b>Geometry</b>          |                                                                   |
| <b>U</b>                 | Undercut behind flange                                            |
| <b>R</b>                 | Radius behind flange (see <b>page 424</b> )                       |
| <b>Surface treatment</b> |                                                                   |
| <b>No code</b>           | Passivated CRES or anodized aluminium                             |
| <b>C<sup>1)</sup></b>    | Cadmium plated on CRES <sup>1)</sup>                              |
| <b>J<sup>1)</sup></b>    | Zinc-nickel plated on CRES <sup>1)</sup>                          |
| <b>Oversize</b>          |                                                                   |
| <b>No code</b>           | Standard outer diameter size                                      |
| <b>Y1<sup>1)</sup></b>   | 0.005 in oversized outer diameter                                 |
| <b>Y2<sup>1)</sup></b>   | 0.010 in oversized outer diameter                                 |

<sup>1)</sup> SK

|                                    |     |
|------------------------------------|-----|
| Material. . . . .                  | 391 |
| Surface treatments. . . . .        | 391 |
| Liners . . . . .                   | 391 |
| Load carrying capability . . . . . | 384 |
| Friction and torque . . . . .      | 384 |
| Operating temperature. . . . .     | 384 |
| Fits and tolerances . . . . .      | 386 |
| Counterface surfaces . . . . .     | 386 |
| Bearing handling. . . . .          | 392 |

More options and sizes available than the standards offers, see 1) and 2).

Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

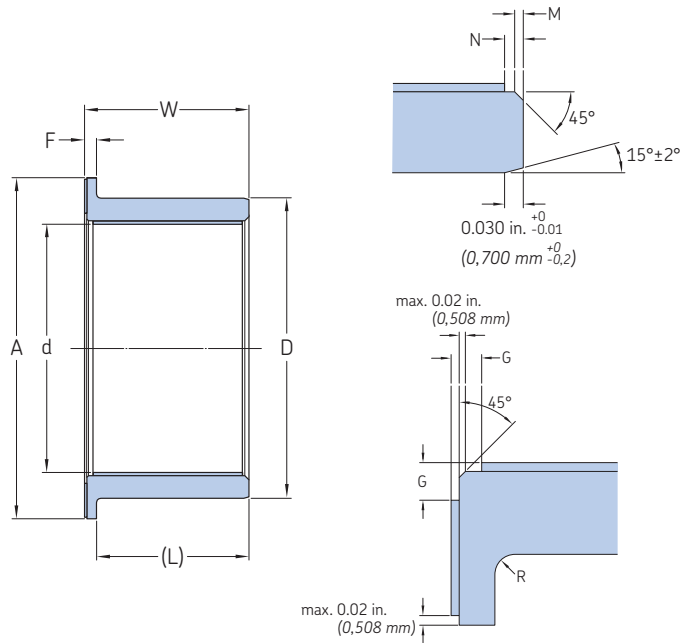
| Length (W)                   |      |       |       |       |       |       |       |       |      |       |       |       |       |       |      | Masses (Code U) |                 |            |  |
|------------------------------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|-----------------|-----------------|------------|--|
| -0.004/-0.016    -0.10/-0.40 |      |       |       |       |       |       |       |       |      |       |       |       |       |       |      |                 |                 |            |  |
| 7/8                          | 1    | 1 1/8 | 1 1/4 | 1 3/8 | 1 1/2 | 1 5/8 | 1 3/4 | 1 7/8 | 2    | 2 1/8 | 2 1/4 | 2 3/8 | 2 1/2 | 2 3/4 | 3    | CRES            | Aluminium alloy |            |  |
| 22,23                        | 25,4 | 28,58 | 31,75 | 34,93 | 38,1  | 41,28 | 44,45 | 47,63 | 50,8 | 53,98 | 57,15 | 60,33 | 63,5  | 69,85 | 76,2 | Per inch        | Flange          | Per inch   |  |
| 28                           | 32   | 36    | 40    | 44    | 48    | 52    | 56    | 60    | 64   | 68    | 72    | 76    | 80    | 88    | 96   | length (L)      |                 | length (L) |  |
| in/mm                        |      |       |       |       |       |       |       |       |      |       |       |       |       |       |      | lb/g            |                 |            |  |

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |                  |                  |                 |                  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|------------------|------------------|-----------------|------------------|
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.017<br>7,842   | 0.0059<br>2,698  | 0.006<br>2,803  | 0.0021<br>0,965  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.021<br>9,414   | 0.0067<br>3,036  | 0.007<br>3,365  | 0.0024<br>1,086  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.024<br>10,990  | 0.0075<br>3,384  | 0.009<br>3,928  | 0.0027<br>1,211  |
| 1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.028<br>12,571  | 0.0082<br>3,724  | 0.010<br>4,493  | 0.0029<br>1,333  |
| 1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.031<br>14,164  | 0.0090<br>4,073  | 0.011<br>5,062  | 0.0032<br>1,458  |
| 1) | 1) | 1) |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.035<br>15,762  | 0.0114<br>5,185  | 0.012<br>5,634  | 0.0041<br>1,855  |
|    | 1) | 1) | 1) | 2) |    |    |    |    |    |    |    |    |    |    |    |  | 0.060<br>27,101  | 0.0142<br>6,437  | 0.021<br>9,686  | 0.0051<br>2,303  |
|    |    | 1) | 1) | 1) | 2) | 2) |    |    |    |    |    |    |    |    |    |  | 0.065<br>29,447  | 0.0172<br>7,818  | 0.023<br>10,525 | 0.0062<br>2,797  |
|    |    | 1) | 1) | 1) | 1) | 2) |    |    |    |    |    |    |    |    |    |  | 0.070<br>31,821  | 0.0206<br>9,340  | 0.025<br>11,373 | 0.0074<br>3,341  |
|    |    |    |    | 1) | 1) | 1) |    |    |    |    |    |    |    |    |    |  | 0.081<br>36,571  | 0.0229<br>10,382 | 0.029<br>13,071 | 0.0082<br>3,714  |
|    |    |    |    |    | 1) | 1) | 1) | 1) |    |    |    |    |    |    |    |  | 0.091<br>41,358  | 0.0252<br>11,432 | 0.033<br>14,782 | 0.0090<br>4,090  |
|    |    |    |    |    |    |    | 1) | 1) | 1) |    |    |    |    |    |    |  | 0.102<br>46,079  | 0.0424<br>19,211 | 0.036<br>16,470 | 0.0152<br>6,873  |
|    |    |    |    |    |    |    |    | 1) | 1) | 1) |    |    |    |    |    |  | 0.112<br>50,800  | 0.0459<br>20,828 | 0.040<br>18,157 | 0.0164<br>7,452  |
|    |    |    |    |    |    |    |    |    |    | 1) |    |    |    |    |    |  | 0.122<br>55,520  | 0.0495<br>22,432 | 0.044<br>19,844 | 0.0177<br>8,026  |
|    |    |    |    |    |    |    |    |    |    |    | 1) | 1) | 1) | 1) |    |  | 0.180<br>81,692  | 0.0530<br>24,051 | 0.064<br>29,198 | 0.0190<br>8,606  |
|    |    |    |    |    |    |    |    |    |    |    |    | 1) | 1) | 1) | 1) |  | 0.194<br>87,971  | 0.0566<br>25,654 | 0.069<br>31,443 | 0.0202<br>9,180  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1) | 1) |  | 0.208<br>94,250  | 0.0601<br>27,274 | 0.074<br>33,687 | 0.0215<br>9,759  |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1) |  | 0.235<br>106,807 | 0.0672<br>30,497 | 0.084<br>38,175 | 0.0241<br>10,911 |

## 4.10 Flanged bearings, code R (inch dimensions)

13E..F..

For code U, see page 422



### Technical specification Product standards

EN 2311  
EN 4537-2 (Corrosion-resistant steel)  
EN 4535-2 (Aluminium alloy)

### Standard materials

Corrosion-resistant steel:  
Surface treatment: 17-4PH Passivated  
Aluminium alloy:  
Surface treatment: 2024 Sulfuric acid anodized  
Liner:  
Surface treatment: X1

| Nominal bore code | R                          | M                      | N                      | G                       |
|-------------------|----------------------------|------------------------|------------------------|-------------------------|
| –                 | in/mm                      |                        |                        |                         |
| 04                | 0.010 ±0.005<br>0,25 ±0,13 | max. 0.02<br>max. 0,50 | max. 0.03<br>max. 0,70 | max. 0.028<br>max. 0,70 |
| 05                | 0.020 ±0.005<br>0,50 ±0,13 | max. 0.02<br>max. 0,50 | max. 0.03<br>max. 0,70 | max. 0.028<br>max. 0,70 |
| 06 to 12          | 0.026 ±0.005<br>0,65 ±0,13 | max. 0.02<br>max. 0,50 | max. 0.03<br>max. 0,70 | max. 0.028<br>max. 0,70 |
| ≥ 14              | 0.026 ±0.005<br>0,65 ±0,13 | max. 0.02<br>max. 0,50 | max. 0.03<br>max. 0,70 | max. 0.039<br>max. 1,00 |

| Nominal bore | Code | Dimensions |                         |          |            | Length (W)                |      |      |      |      |       |      |       |      |       |       |       |       |  |
|--------------|------|------------|-------------------------|----------|------------|---------------------------|------|------|------|------|-------|------|-------|------|-------|-------|-------|-------|--|
|              |      | d          | D                       | F        | A (Code R) | -0.004/-0.016 -0,10/-0,40 |      |      |      |      |       |      |       |      |       |       |       |       |  |
| Dia-meter    |      | 0/-0.0010  | 0/-0.0005 <sup>3)</sup> | 0/-0.005 | 0/-0.020   | 3/16                      | 7/32 | 1/4  | 9/32 | 5/16 | 11/32 | 3/8  | 7/16  | 1/2  | 9/16  | 5/8   | 11/16 | 3/4   |  |
|              |      | 0/-0,0254  | 0/-0,0127               | 0/-0,127 | 0/-0,508   | 4,76                      | 5,56 | 6,35 | 7,14 | 7,94 | 8,73  | 9,53 | 11,11 | 12,7 | 14,29 | 15,88 | 17,46 | 19,05 |  |
|              |      |            |                         |          |            | 06                        | 07   | 08   | 09   | 10   | 11    | 12   | 14    | 16   | 18    | 20    | 22    | 24    |  |
| in           |      | in/mm      |                         |          |            | in/mm                     |      |      |      |      |       |      |       |      |       |       |       |       |  |

|       |    |                  |                  |                 |                  |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-------|----|------------------|------------------|-----------------|------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1/4   | 04 | 0.2515<br>6,388  | 0.3760<br>9,550  | 0.0625<br>1,587 | 0.5000<br>12,700 |    |    |    |    |    |    |    | 1) | 1) |    |    |    |    |
| 5/16  | 05 | 0.3140<br>7,976  | 0.4386<br>11,140 | 0.0625<br>1,587 | 0.5630<br>14,290 |    |    |    |    |    |    |    |    |    | 1) | 1) |    |    |
| 3/8   | 06 | 0.3765<br>9,563  | 0.5012<br>12,730 | 0.0625<br>1,587 | 0.6250<br>15,880 |    |    |    |    |    |    |    |    |    |    | 1) | 1) | 1) |
| 7/16  | 07 | 0.4390<br>11,151 | 0.5638<br>14,321 | 0.0625<br>1,587 | 0.7500<br>19,050 |    |    |    |    |    |    |    |    |    |    |    | 1) | 1) |
| 1/2   | 08 | 0.5015<br>12,738 | 0.6265<br>15,913 | 0.0625<br>1,587 | 0.8750<br>22,230 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9/16  | 09 | 0.5640<br>14,326 | 0.6892<br>17,506 | 0.0625<br>1,587 | 0.9380<br>23,820 | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) |
| 5/8   | 10 | 0.6265<br>15,913 | 0.8142<br>20,681 | 0.0625<br>1,587 | 1.0000<br>25,400 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 11/16 | 11 | 0.6890<br>17,501 | 0.8767<br>22,268 | 0.0625<br>1,587 | 1.0630<br>26,990 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3/4   | 12 | 0.7515<br>19,088 | 0.9393<br>23,858 | 0.0625<br>1,587 | 1.1250<br>28,580 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7/8   | 14 | 0.8765<br>22,263 | 1.0645<br>27,038 | 0.0625<br>1,587 | 1.2500<br>31,750 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1     | 16 | 1.0015<br>25,438 | 1.1898<br>30,221 | 0.0625<br>1,587 | 1.3750<br>34,930 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 1/8 | 18 | 1.1265<br>28,613 | 1.3148<br>33,396 | 0.094<br>2,390  | 1.6250<br>41,280 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 1/4 | 20 | 1.2515<br>31,788 | 1.4398<br>36,571 | 0.094<br>2,390  | 1.7500<br>44,450 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 3/8 | 22 | 1.3765<br>34,963 | 1.5648<br>39,746 | 0.094<br>2,390  | 1.8750<br>47,630 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 1/2 | 24 | 1.5015<br>38,138 | 1.7523<br>44,508 | 0.094<br>2,390  | 2.0000<br>50,800 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 5/8 | 26 | 1.6265<br>41,313 | 1.8773<br>47,683 | 0.094<br>2,390  | 2.1250<br>53,980 |    |    |    |    |    |    |    |    |    | 2) | 2) | 2) | 2) |
| 1 3/4 | 28 | 1.7515<br>44,488 | 2.0023<br>50,858 | 0.094<br>2,390  | 2.2500<br>57,150 |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2     | 32 | 2.0015<br>50,838 | 2.2523<br>57,208 | 0.094<br>2,390  | 2.5000<br>63,500 |    |    |    |    |    |    |    |    |    |    |    |    |    |

1) SKF option for corrosion-resistant steel bearings 2) SKF option

3) These values apply for corrosion-resistant steel bearings. For aluminium alloy bearings, tolerance is ±0.0005 in (±0.0013 mm)

|           |              |     |   |   |    |    |   |    |
|-----------|--------------|-----|---|---|----|----|---|----|
| Examples: | 13EAF0406UY1 | 13E | A | F | 04 | 06 | U | Y1 |
|           | 13EAF0406R   | 13E | A | F | 04 | 06 | R |    |
|           | 13ESF1636UY2 | 13E | S | F | 16 | 36 | U | Y2 |

|                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| <b>Material</b>          |                                                                   |
| <b>S</b>                 | Corrosion-resistant steel (CRES)                                  |
| <b>A</b>                 | Aluminium alloy                                                   |
| <b>Bore code</b>         |                                                                   |
| <b>...</b>               | Two digits, see <i>Nominal bore code (multiples of 1/16 inch)</i> |
| <b>Length code</b>       |                                                                   |
| <b>...</b>               | Two digits, see <i>Length code (multiples of 1/32 inch)</i>       |
| <b>Geometry</b>          |                                                                   |
| <b>U</b>                 | Undercut behind flange (see <b>page 422</b> )                     |
| <b>R</b>                 | Radius behind flange                                              |
| <b>Surface treatment</b> |                                                                   |
| <b>No code</b>           | Passivated CRES or anodized aluminium                             |
| <b>C<sup>1)</sup></b>    | Cadmium plated on CRES                                            |
| <b>J<sup>1)</sup></b>    | Zinc-nickel plated on CRES                                        |
| <b>Oversize</b>          |                                                                   |
| <b>No code</b>           | Standard outer diameter size                                      |
| <b>Y1<sup>1)</sup></b>   | 0.005 in oversized outer diameter                                 |
| <b>Y2<sup>1)</sup></b>   | 0.010 in oversized outer diameter                                 |

|                                    |     |
|------------------------------------|-----|
| Material. . . . .                  | 391 |
| Surface treatments. . . . .        | 391 |
| Liners . . . . .                   | 391 |
| Load carrying capability . . . . . | 384 |
| Friction and torque . . . . .      | 384 |
| Operating temperature. . . . .     | 384 |
| Fits and tolerances . . . . .      | 386 |
| Counterface surfaces . . . . .     | 386 |
| Bearing handling. . . . .          | 392 |

Contact SKF at [skf.com/go/aero](http://skf.com/go/aero)

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |                 |                  |                 |                |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|-----------------|------------------|-----------------|----------------|
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.017<br>7,842  | 0.0026<br>1,177  | 0.006<br>2,803  | 0.009<br>0,421 |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.021<br>9,414  | 0.0030<br>1,373  | 0.007<br>3,365  | 0.011<br>0,491 |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.024<br>10,990 | 0.0035<br>1,570  | 0.009<br>3,928  | 0.012<br>0,561 |
| 1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.028<br>12,571 | 0.0051<br>2,329  | 0.010<br>4,493  | 0.018<br>0,832 |
| 1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.031<br>14,164 | 0.0071<br>3,239  | 0.011<br>5,062  | 0.026<br>1,158 |
| 2) | 2) | 2) |    |    |    |    |    |    |    |    |    |    |    |    |    |  | 0.035<br>15,762 | 0.0077<br>3,498  | 0.012<br>5,634  | 0.028<br>1,250 |
|    | 1) | 1) | 1) | 2) |    |    |    |    |    |    |    |    |    |    |    |  | 0.060<br>27,101 | 0.0084<br>3,825  | 0.021<br>9,686  | 0.030<br>1,367 |
|    |    | 1) | 1) | 1) | 2) | 2) |    |    |    |    |    |    |    |    |    |  | 0.065<br>29,447 | 0.0091<br>4,120  | 0.023<br>10,525 | 0.032<br>1,473 |
|    |    | 1) | 1) | 1) | 1) | 2) |    |    |    |    |    |    |    |    |    |  | 0.070<br>31,821 | 0.0097<br>4,416  | 0.025<br>11,373 | 0.035<br>1,578 |
|    |    | 1) | 1) | 1) | 1) | 1) |    |    |    |    |    |    |    |    |    |  | 0.081<br>36,571 | 0.011<br>5,001   | 0.029<br>13,071 | 0.039<br>1,788 |
|    |    |    |    |    |    | 1) | 1) | 1) | 1) |    |    |    |    |    |    |  | 0.091<br>41,358 | 0.0123<br>5,593  | 0.033<br>14,782 | 0.044<br>1,999 |
|    |    |    |    |    |    |    |    | 1) | 1) | 1) |    |    |    |    |    |  | 0.102<br>46,079 | 0.0284<br>12,901 | 0.036<br>16,470 | 0.046<br>4,611 |
|    |    |    |    |    |    |    |    |    | 1) | 1) | 1) |    |    |    |    |  | 0.112<br>50,800 | 0.031<br>14,067  | 0.040<br>18,157 | 0.049<br>5,028 |
|    |    |    |    |    |    |    |    |    |    |    | 1) |    |    |    |    |  | 0.122<br>55,520 | 0.0336<br>15,246 | 0.044<br>19,844 | 0.052<br>5,449 |
|    |    |    |    |    |    |    |    |    |    |    |    | 1) | 1) | 1) | 1) |  | 0.180<br>81,692 | 0.0362<br>16,411 | 0.064<br>29,198 | 0.074<br>5,865 |
| 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) | 2) |  | 0.194<br>87,971 | 0.0387<br>17,560 | 0.069<br>31,443 | 0.087<br>6,276 |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1) | 1) |  | 0.194<br>87,971 | 0.0413<br>18,755 | 0.069<br>31,443 | 0.087<br>6,703 |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1) |  | 0.208<br>94,250 | 0.0465<br>21,099 | 0.074<br>33,687 | 0.099<br>7,541 |

# Cross-reference

## Metric bearings

| EN part number       | SKF designation |                   |
|----------------------|-----------------|-------------------|
| EN2285- <b>dW</b> AR | <b>dW</b> AAK   | 13C <b>dW</b> AAZ |
| EN2286- <b>dW</b> AR | <b>dW</b> FAAK  | 13C <b>dW</b> AAF |
| EN2287- <b>dW</b> A  | <b>dW</b> SK    | 13C <b>dW</b> SZ  |
| EN2288- <b>dW</b>    | <b>dW</b> FSK   | 13C <b>dW</b> SF  |

Where

**d** = inner diameter of journal bearing

**W** = overall width of journal bearing

### Example

| EN part number         | SKF designation |                     |
|------------------------|-----------------|---------------------|
| EN2285- <b>2022</b> AR | <b>2022</b> AAK | 13C <b>2022</b> AAZ |
| EN2288- <b>5040</b>    | <b>5040</b> FSK | 13C <b>5040</b> SF  |

| AS part number          | SKF designation    |
|-------------------------|--------------------|
| M81934/1- <b>dA0W</b>   | 13BAZ <b>dW</b>    |
| M81934/1- <b>dC0W</b>   | 13BSZ <b>dW</b>    |
| M81934/1- <b>dC0WP</b>  | 13BSZ <b>dWC</b>   |
| M81934/1- <b>dC0WE</b>  | 13BSZ <b>dWJ</b>   |
| M81934/1- <b>dA0WT</b>  | 13BAZ <b>dWY2</b>  |
| M81934/1- <b>dC0WT</b>  | 13BSZ <b>dWY2</b>  |
| M81934/1- <b>dC0WPT</b> | 13BSZ <b>dWCY2</b> |
| M81934/1- <b>dC0WET</b> | 13BSZ <b>dWJY2</b> |
| M81934/1- <b>dA0WU</b>  | 13BAZ <b>dWY4</b>  |
| M81934/1- <b>dC0WU</b>  | 13BSZ <b>dWY4</b>  |
| M81934/1- <b>dC0WPU</b> | 13BSZ <b>dWCY4</b> |
| M81934/1- <b>dC0WEU</b> | 13BSZ <b>dWJY4</b> |
| M81934/2- <b>dA0L</b>   | 13BAF <b>dL</b>    |
| M81934/2- <b>dC0L</b>   | 13BSF <b>dL</b>    |
| M81934/2- <b>dC0LP</b>  | 13BSF <b>dLC</b>   |
| M81934/2- <b>dC0LE</b>  | 13BSF <b>dLJ</b>   |
| M81934/2- <b>dA0LT</b>  | 13BAF <b>dLY2</b>  |
| M81934/2- <b>dC0LT</b>  | 13BSF <b>dLY2</b>  |
| M81934/2- <b>dC0LPT</b> | 13BSF <b>dLCY2</b> |
| M81934/2- <b>dC0LET</b> | 13BSF <b>dLJY2</b> |
| M81934/2- <b>dA0LU</b>  | 13BAF <b>dLY4</b>  |
| M81934/2- <b>dC0LU</b>  | 13BSF <b>dLY4</b>  |
| M81934/2- <b>dC0LPU</b> | 13BSF <b>dLCY4</b> |
| M81934/2- <b>dC0LEU</b> | 13BSF <b>dLJY4</b> |

Where

**d** = inner diameter of journal bearing

**W** = overall width of journal bearing

**L** = length to back face of flange

### Example

| AS part number           | SKF designation     |
|--------------------------|---------------------|
| M81934/1- <b>08C014</b>  | 13BSZ <b>0814</b>   |
| M81934/2- <b>20A032U</b> | 13BAF <b>2032Y4</b> |

## Inch bearings

| EN part number        | SKF designation  |
|-----------------------|------------------|
| EN4534-2V <b>d0W</b>  | 13EAZ <b>dW</b>  |
| EN4536-2T <b>d0W</b>  | 13ESZ <b>dW</b>  |
| EN4535-2D <b>dV0W</b> | 13EAF <b>dWU</b> |
| EN4535-2F <b>dV0W</b> | 13EAF <b>dWR</b> |
| EN4537-2D <b>dT0W</b> | 13ESF <b>dWU</b> |
| EN4537-2F <b>dT0W</b> | 13ESF <b>dWR</b> |

Where

**d** = inner diameter of journal bearing

**W** = overall width of journal bearing

### Example

| EN part number          | SKF designation    |
|-------------------------|--------------------|
| EN4536-2T <b>09006</b>  | 13ESZ <b>0906</b>  |
| EN4535-2D <b>04V012</b> | 13EAF <b>0412U</b> |



| NSA part number     | SKF designation |                 |
|---------------------|-----------------|-----------------|
| NSA8145- <b>d-X</b> | KS <b>d</b> WP  | 13ASZ <b>dW</b> |
| NSA8146- <b>d-X</b> | KA <b>d</b> WP  | 13AAZ <b>dW</b> |
| NSA8147- <b>d-X</b> | KS <b>Fd</b> WP | 13ASF <b>dW</b> |
| NSA8148- <b>d-X</b> | KA <b>Fd</b> WP | 13AAF <b>dW</b> |

Where

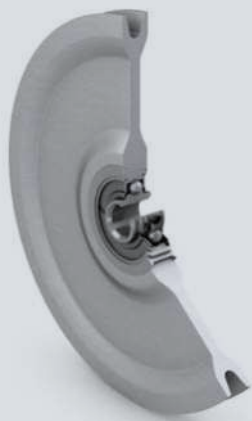
**d** = inner diameter of journal bearing

**W** = overall width of journal bearing

**X** =  $W \times 2$  (except for  $W = 02$  where  $X = 05$ )

#### Example

| NSA part number       | SKF designation  |                   |
|-----------------------|------------------|-------------------|
| NSA8145- <b>08-12</b> | KS <b>0806</b> P | 13ASZ <b>0806</b> |
| NSA8146- <b>06-08</b> | KA <b>0604</b> P | 13AAZ <b>0604</b> |



## Engineered pulleys



# 5 Engineered pulleys

|                                           |            |
|-------------------------------------------|------------|
| <b>Designs and variants</b> . . . . .     | <b>430</b> |
| <b>Pulley selection process</b> . . . . . | <b>430</b> |
| Load carrying capability . . . . .        | 431        |
| Lubrication . . . . .                     | 431        |
| Operating temperature. . . . .            | 431        |
| Internal clearance. . . . .               | 431        |
| Material. . . . .                         | 431        |
| Rolling bearings . . . . .                | 431        |
| Pulley bodies. . . . .                    | 431        |
| Surface treatments. . . . .               | 432        |
| Rolling bearings . . . . .                | 432        |
| Pulley bodies. . . . .                    | 432        |
| Sealing solutions. . . . .                | 432        |
| <b>Legacy products</b> . . . . .          | <b>432</b> |

# 5 Engineered pulleys

Pulleys are used widely in flight control applications for cable control. They consist of a body and an inserted rolling bearing with a cage.

Pulleys carry loads and enable rotational movements with minimal friction.

## 5 Designs and variants

Pulleys are made of either a metallic or a non-metallic body and a rolling bearing. The bearing is typically crimped into a metallic ring inserted in the body (**figures 1 and 2**). Pulley bodies can have one or two grooves to accommodate cables (**figure 3**). Bearings used for pulleys are single row or double row deep groove ball bearings with a cage.

Compared to standard full complement airframe bearings as described in *Rolling Bearings* **page 30**, pulley bearings with a cage provide:

- Reduced friction
- Reduced load carrying capability. Refer to *Load carrying capability* **page 431** for more information about the capacity of pulley bearings.

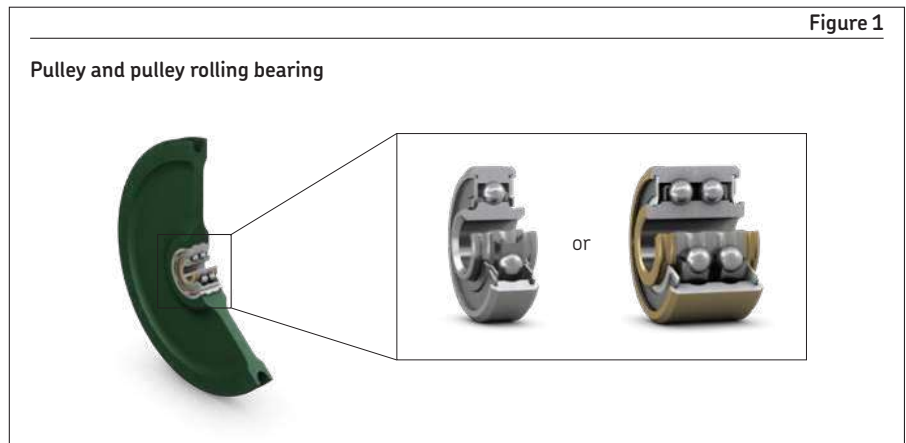
The pulley grooves are designed considering the external diameter of the cables. When coated, consider the cable diameter and the coating thickness.

## Pulley selection process

The pulley design, including material, number of bearing rolling elements and number of pulley body grooves, is selected based on load carrying capability requirements, (**page 431**), cable diameter and compactness requirements.

Often the boundary dimensions of a pulley are predetermined by the space available on the aircraft system. Typically, the shaft diameter determines the bearing bore diameter.

Other options including *Lubrication* **page 431**, *Sealing solutions* **page 432**, *Surface treatments* **page 432** and *Internal clearance* **page 431**, are then selected.



## Load carrying capability

Pulleys can sustain static radial loads and dynamic loads.

The load carrying capability of pulleys is described by:

|           |                                               |
|-----------|-----------------------------------------------|
| <b>CE</b> | Endurance dynamic load                        |
| <b>CR</b> | Radial static load of the pulley              |
| <b>CB</b> | Groove flange strength static load            |
| <b>CL</b> | Bearing-pulley body bond strength static load |

These loads, as defined in AS 7034 (Pulleys, groove, anti-friction bearing, grease lubricated, aircraft, general specification) and EN 2062 (Fully non-metallic body pulleys, with bearings, for control cables technical specification aerospace series), are linked to the cable strengths, which are a function of the cable diameter, cable structure and materials.

Pulleys are designed according to the relevant product standards and tested as per the relevant technical standards.

Contact SKF for more information.

## Lubrication

The pulley bearings are lubricated for life and cannot be relubricated. At least 80% of the free space in the bearing is filled with grease. Lubricant details are listed in **table 1**:

Lubrication is primarily chosen according to the operating temperature.

## Operating temperature

The permissible operating temperature of pulleys is typically limited by the capability of the grease in the bearing. See **table 1**.

For operation outside this temperature range, bearing life and performance may be reduced. Contact SKF.

## Internal clearance

Pulley bearings can be provided with standard or increased internal clearance, as defined in *Rolling bearings – Internal clearance* **page 47**.

## Material

### Rolling bearings

Bearing rings and rolling elements are either made of bearing steel or corrosion-resistant steel (**table 2**).

Cages are made of light alloy steel.

### Pulley bodies

Non-metallic pulley bodies are made of a moulded glass fibre reinforced phenolic compound.

Metallic pulley bodies are made of aluminium alloy (grade 2024 to QQ-A-200/3 T8511).

Crimping rings are typically made of aluminium alloy or light alloy steel.

Contact SKF for other materials.



## Surface treatments

Surface treatments are used to increase general corrosion resistance and fretting resistance.

### Rolling bearings

Surface treatments are applied to ring surfaces, except raceways and the bore of the inner ring.

Cadmium or zinc-nickel plating can be selected.

- Cadmium plating is applied according to AMS QQP416. It is carried out with or without a chromate treatment following the chosen standard. This treatment can include chromium 6 compounds and may be subject to environmental legislation.
- Zinc-nickel plating is a chromium 6 free alternative to cadmium plating, compliant to environmental legislation. Zinc-nickel plating is applied in accordance with AMS 2417.

## Pulley bodies

Metallic pulley bodies are typically protected by sulfuric acid anodizing and a wear-resistant coating in the groove in accordance with the relevant product standards.

Sulfuric acid anodizing complies with AMS03-25 (formerly DEF STAN 03-25) or MIL-A-8625.

SKF can propose other surface treatments for specific purposes.

## Sealing solutions

There are two types of bearing sealing solutions to prevent ingress of foreign matter:

- Shield
- Seal

Sealing can increase the starting rotational torque.

Refer to the *Rolling bearings* section **page 30** for more information.

## Legacy products

The following legacy series according to their relevant standards can still be supplied:

**Metric** P., PNA., P..SP., P..MSP.

**Metric** PN., PA., EN 2081, technical standard EN 2062

**Inch** P..SP, technical standard AS 7034

**Inch** PNU 219 ... to PNU 221 ..., MIL-DTL-7034/1 to MIL-DTL-7034/3, technical standard AS 7034

Table 1

#### Standard greases

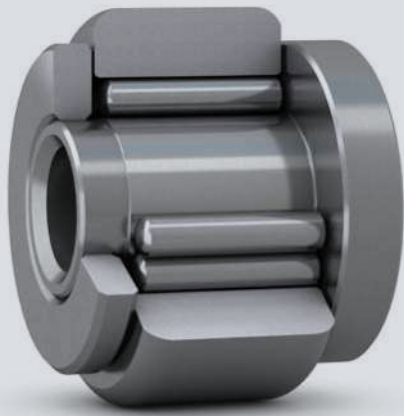
| NATO codes | Standard             | Operating temperature               |
|------------|----------------------|-------------------------------------|
| G354       | MIL PRF 23827 type I | -73 to +121 °C<br>(-100 to +250 °F) |
| G395       | MIL PRF 81322        | -54 to +177 °C<br>(-64 to +350 °F)  |

Table 2

#### Pulley rolling bearing materials

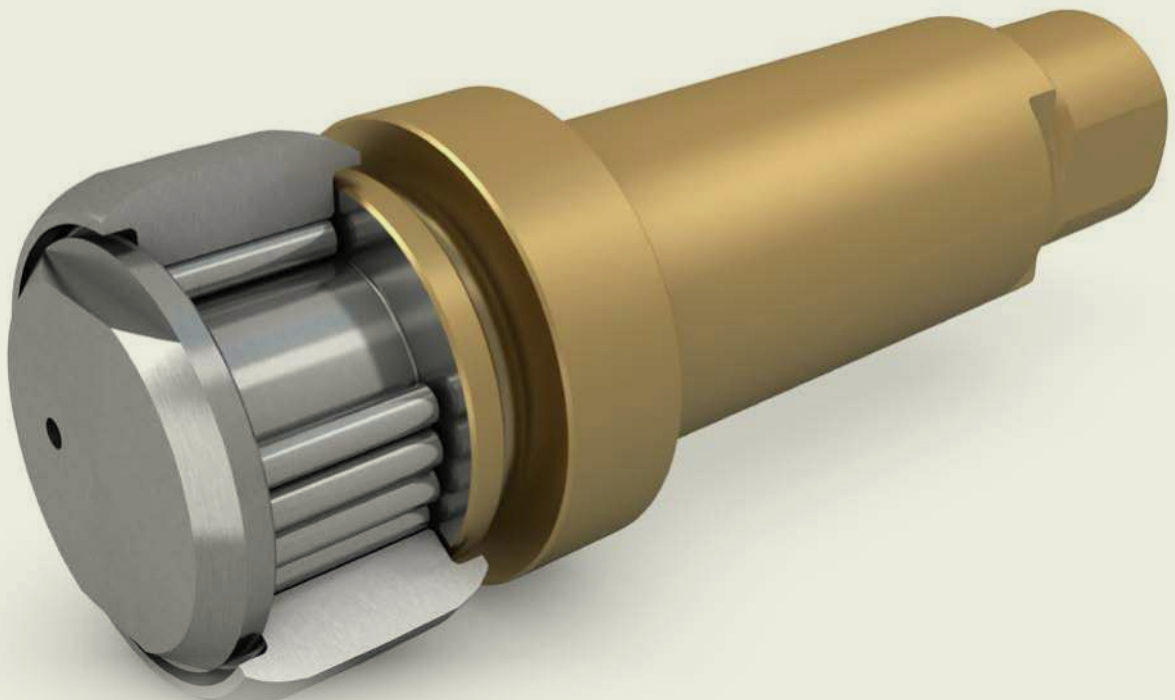
| Steel type                | Corrosion resistance | Hardness HRC | Material designation | EN standards | AMS standards        | Designation           |
|---------------------------|----------------------|--------------|----------------------|--------------|----------------------|-----------------------|
| Bearing steel             | Moderate             | 60 to 64     | 52 100               | EN 2031      | AMS 6440 or AMS 6444 | 100Cr6 (100C6)        |
| Corrosion-resistant steel | Good                 | ≥ 58         | 440C                 | EN 2030      | AMS 5630 or AMS 5618 | X105CrMo17 (Z100CD17) |





6

## Engineered needle bearings





# 6 Engineered needle bearings

|                                      |            |
|--------------------------------------|------------|
| <b>Designs and variants</b> .....    | <b>436</b> |
| <b>Basic selection process</b> ..... | <b>436</b> |
| Load carrying capability .....       | 436        |
| Lubrication .....                    | 437        |
| Lubricants .....                     | 437        |
| Operating temperature .....          | 437        |
| Material .....                       | 437        |
| Surface treatments .....             | 437        |
| <b>Mounting</b> .....                | <b>437</b> |

# 6 Engineered needle bearings

Needle bearings are used widely in flight control applications. They are a compact solution that interposes between two elements in translation with respect to each other and enable rotational movements with minimal friction, at relatively low speed.

## Designs and variants

SKF supplies needle bearings with:

- An integrated axle – such units are generally referred to as needle track roller bearings, while needle bearings with no integrated axle are referred to as needle roller bearings
- One or two rows of rolling elements

See **figure 1**.

Designs with an integrated axle are typically the most compact solution.

Bearings with a double row of rolling elements typically have a larger load carrying capability than a same size bearing with a single row of rolling elements.

For general information about rolling bearings, refer to *Rolling bearings* chapter **page 30** for more information.

Contact SKF for specific designs, such as track rollers with liners or with cylindrical rollers as rolling elements.

## Basic selection process

Needle bearings are selected based on load carrying capability (**page 436**) and compactness.

Often the boundary dimensions of a bearing are predetermined by the space available on the aircraft system. Typically, the shaft diameter determines the bearing bore diameter.

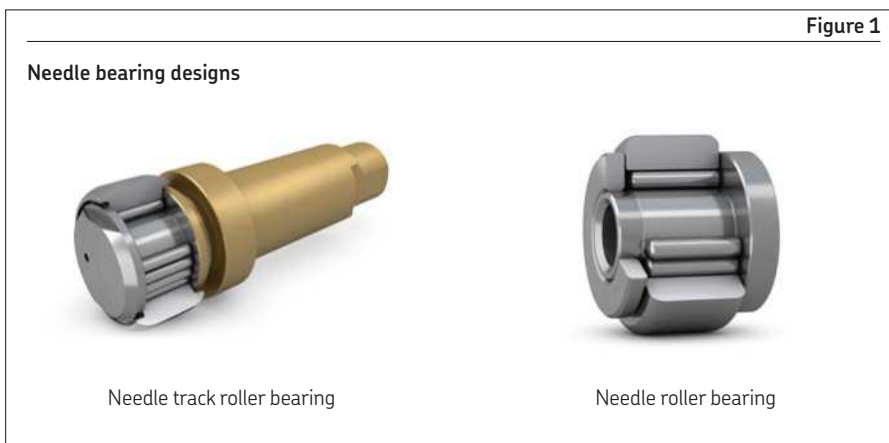
Other options including *Lubrication* **page 437**, *Materials* **page 437** and *Surface treatments* **page 437** are then selected.

## Load carrying capability

Needle bearings can accommodate static and dynamic radial loads, as defined in *Rolling bearings – Load carrying capabilities* **page 37**.

Bearing life depends on many parameters, such as load, speed, oscillation angle, lubrication and environmental conditions.

Contact SKF for more information.



# Lubrication

Needle bearings are supplied with grease, ready to be put into operation.

Depending on application conditions, they may require periodic relubrication. This is especially suitable for endurance loading conditions. For optimum bearing performance, relubrication should be performed frequently, for instance, during aircraft planned maintenance.

The lubrication helps to:

- Reduce friction
- Reduce wear rate
- Extend bearing service life
- Protect against corrosion
- Block contamination from entering the bearing

## Lubricants

For typical greases used for needle bearings, see **table 1**.

Lubrication is primarily chosen according to the operating temperature.

**WARNING:** To prevent risk of bearing failure, use the same lubricant as supplied when relubricating.

## Operating temperature

The permissible operating temperature of needle roller bearings is typically limited by the grease capability. See **table 1**.

For operation outside this temperature range, bearing life and performance may be reduced. Contact SKF.

## Material

Rolling elements can be made of bearing steels for good mechanical properties or corrosion-resistant steels for increased corrosion resistance.

Axles are typically made of case-hardening steel materials with a soft core and hard surface, providing increased mechanical resistance.

Rings can be made of bearing steel for good mechanical properties, corrosion-resistant steel for increased corrosion resistance, or case-hardening steel with a soft core and hard surface, providing increased mechanical resistance.

**Table 2** gives the different designations, reference standards and key characteristics of materials used for SKF needle bearings.

## Surface treatments

Surface treatments are used to increase general corrosion resistance and increase fretting resistance.

Typical surface treatments can include, but are not limited to:

- Cadmium plating per AMS03-19 (Formerly DEF STAN 03-19) or AMS QQP416<sup>1)</sup>
- Zinc-nickel plating per AMS 2417
- Chemical passivation per AMS 2700
- Nitriding

Contact SKF for more information and other specific surface treatments.

Table 1

| Standard greases |                      |                                     |
|------------------|----------------------|-------------------------------------|
| NATO codes       | Standard             | Operating temperature               |
| G354             | MIL PRF 23827 type I | −73 to +121 °C<br>(−100 to +250 °F) |
| G395             | MIL PRF 81322        | −54 to +177 °C<br>(−64 to +350 °F)  |

Table 2

| Material type                            | Corrosion resistance | Material designation | EN      | AMS                  | Equivalent designation |
|------------------------------------------|----------------------|----------------------|---------|----------------------|------------------------|
| Bearing steel                            | Moderate             | 52100                | EN 2031 | AMS 6440 or AMS 6444 | 100Cr6 (100C6)         |
| Corrosion-resistant steel                | Good                 | 440C                 | EN 2030 | AMS 5630 or AMS 5618 | X105CrMo17 (Z100CD17)  |
| Case hardening alloy steel               | Moderate             | 9315                 | EN 2099 | AMS 6263             | 16NCD13                |
| Case hardening corrosion-resistant steel | Good                 | 431                  | EN 3490 | AMS 5628             | Z15CN17.03             |

## Mounting

Needle roller bearings are typically mounted with a clearance fit between the bearing inner ring and the shaft.

Needle track roller bearings are typically mounted with a transition fit between the bearing axle and the housing (H7g6).

<sup>1)</sup> Treatment includes chromium 6 compounds and may be subject to environmental legislation



## Engineered composite solutions



# 7 Engineered composite solutions

|                                  |            |
|----------------------------------|------------|
| <b>Design and variants</b> ..... | <b>440</b> |
| Structural rods .....            | 440        |
| Adjustable rods .....            | 441        |
| Other composite solutions .....  | 441        |

# 7 Engineered composite solutions

SKF has unique expertise in designing, manufacturing and testing composite solutions.

SKF supplies composite rods and fittings for airframe applications, customized to meet the most demanding application requirements including lightweight and high load carrying capability.

SKF composite solutions can be used to achieve a targeted stiffness and accommodate vibrations. They have low thermal expansion properties and reduce the risk of corrosion compared to metallic rod designs.

Composites can be made from:

- Glass fibre, providing electrical insulation
- Carbon fibre, providing electrical conductivity

The application of paint on composite rods is possible.

A conduction braid can also be provided.

Composite rods can be supplied with interfaces such as fork ends or rod ends and using inserted or integrated bearings. For more information about the design and capability of different interfaces, refer to *Rod ends* **page 280**, *Spherical plain bearings* **page 126**, *Rolling bearings* **page 30** and *Self-lubricating journal bearings* **page 390**.

Composite solutions can be found in many applications including:

- Centre-wing boxes
- Floor to floor connection
- Motion transmission
- Belly fairing
- Flight control applications

## Design and variants

### Structural rods

Structural rods are typically used in centre-wing box applications and as floor beam struts. They consist of a tube and fork end made in one monolithic composite part, see **figure 1**. They are designed to sustain high tension and compression loads.

SKF supplies dimensions from 40 to 100 mm (1.57 to 3.94 in) in tube diameter and from 600 to 2 500 mm (23.6 to 98.4 in) in length.

For information on customized designs, refer to *Other composite solutions* **page 441**.



Figure 1

Structural rods

## Adjustable rods

Adjustable rods consist of a composite tube with a standard or customized metallic rod end (Refer to *Airframe rod ends*, **page 280** for more information) or fork end as interfaces, see **figure 2**.

They are typically used in fairing or flight control applications.

They allow for precision length adjustment to application requirements by screwing or unscrewing of the rod end or fork end. A locking device based on standard or customized nut (with or without locking hole) and washer (tab washer, lock washer with half turn adjustment or lock washer with radial serrations) is used.

Fork ends, nuts and washers are typically made of:

- Anodized titanium
- Corrosion-resistant steel, passivated or cadmium plated
- Cadmium plated steel

The body-end connection is typically made by using a titanium insert.

SKF supplies dimensions from 14 to 40 mm (0.55 to 1.57 in) in tube diameter and from 200 to 2 000 mm (7.87 to 78.7 in) in length.

For information on customized designs, refer to *Other composite solutions*, below.

## Other composite solutions

SKF Black Design composite fittings as well as other rod designs and other solutions for interfaces to applications can be supplied. Some examples are given in **figure 3**.

Contact SKF at [skf.com/go/aero](http://skf.com/go/aero) for more customized designs.

Figure 2

### Adjustable rods



Figure 3

### Examples of other composite solutions



SKF Black Design composite fitting



Customized rod design



Universal joints



Double fork end





# B Customized bearings for aeroengine solutions

|                                                     |     |
|-----------------------------------------------------|-----|
| 8 Customized bearings for aeroengine solutions..... | 444 |
|-----------------------------------------------------|-----|



8

## Customized bearings for aeroengine solutions



# 8 Customized bearings for aeroengine solutions

|                                               |            |
|-----------------------------------------------|------------|
| <b>Design and variants</b> .....              | <b>447</b> |
| Sizes .....                                   | 448        |
| Tolerances .....                              | 448        |
| Special design features and options .....     | 448        |
| Materials .....                               | 449        |
| Materials of rings and rolling elements ..... | 449        |
| Materials of cages .....                      | 449        |
| <b>Storage</b> .....                          | <b>450</b> |
| <b>Bearing remanufacturing</b> .....          | <b>450</b> |

SKF Aeroengine bearings are customized solutions for aircraft engines and transmission equipment (gearbox, drivetrain). They are high precision, compact bearings with an exceptional power to weight ratio.

Such bearings can offer long service lives and can operate at high speeds and under severe environmental conditions, such as high temperature, see **table 2**.

SKF’s unique capabilities in technology development and testing of customized solutions for aeroengine bearings has helped aircraft engines to become more fuel-efficient, lightweight and reliable.

SKF supplies aeroengine ball bearings (deep groove, angular contact, three and four-point contact), cylindrical roller bearings, tapered roller bearings and spherical roller bearings, customized to meet the most demanding requirements.

Example of solutions can include but are not limited to:

Table 1

| Function                                                                                                                                                                     | Typical SKF solutions                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Engines and auxiliary power units (APU) main shaft bearings                                                                                                                  |    |
| Accessory gearbox bearings (AGB), propeller gearbox bearings (PGB) and reduction gearbox bearings (RGB)                                                                      |   |
| Bearings for helicopter drive-trains: transmission bearings, intermediate and tail gearbox bearings, mast rotor bearings                                                     |   |
| Helicopter main rotor bearings: swash plate bearings and blade support bearings.                                                                                             |  |
| Bearings for auxiliary systems: fuel pumps, starters, flight-control gearboxes, electromechanical actuation systems and thrust reversers, telecommunication systems support. |  |
| Spacecraft applications: engines, pumps, etc.                                                                                                                                |   |

# Design and variants

**Table 3** provides general guidelines for selecting bearing type based on application requirements. For more information, contact your regional SKF partner at [www.skf.com/go/aero](http://www.skf.com/go/aero).

Double row deep groove ball bearings, double row angular contact ball bearings and double row tapered roller bearings are typically pre-loaded. The pre-loading is used to:

- Enhance the bearing load carrying capability
- Enhance the dynamic misalignment capability of the bearing
- Increase the bearing stiffness

Aeroengine bearings can use SKF Aerospace precision specialty balls, available in a wide range of dimensions, materials and precision tolerances to meet the most demanding application requirements.

SKF also supplies specialty balls separately for various applications including fluid and flow controls, linear guides, balls screws, or ball transfer units.

As aeroengine bearings are used in high-speed applications, they are typically oil lubricated and have cages as rolling element separators to avoid friction between rolling elements.

Table 2

## Typical operating condition

| Range             | Temperature (°C / °F)               | Speed factor (nd <sub>m</sub> <sup>1)</sup> ) |
|-------------------|-------------------------------------|-----------------------------------------------|
| Low to normal     | < 150 °C (< 302 °F)                 | < 1,5 million nd <sub>m</sub>                 |
| Normal to high    | 150 °C to 220 °C (302 °F to 428 °F) | 1,5 to 2,5 million nd <sub>m</sub>            |
| High to very high | > 220 °C (> 428 °F)                 | > 2,5 million nd <sub>m</sub>                 |

<sup>1)</sup> The speed factor nd<sub>m</sub> is defined as the rotational speed (in rotations per minute r/min) multiplied by the bearing mean diameter (mm)

Table 3

| Bearing type                                                                         | Number of rows and pre-load | Load carrying capability |            |             | Misalignment |         | Suitable for |                |              |
|--------------------------------------------------------------------------------------|-----------------------------|--------------------------|------------|-------------|--------------|---------|--------------|----------------|--------------|
|                                                                                      |                             | Radial load              | Axial load | Moment load | Static       | Dynamic | High speed   | High stiffness | Low friction |
| Deep groove ball bearings                                                            | 1 row                       | ++                       | ++         | ++          | ++           | -       | +++          | ++             | ++++         |
|                                                                                      | 2 rows pre-loaded           | +++                      | +++        | +++         | ++           | +       | ++           | +++            | +++          |
| Angular contact ball bearings                                                        | 1 row                       | ++                       | +++ ←      | --          | ++           | -       | ++++         | ++             | +++          |
|                                                                                      | 2 rows pre-loaded           | +++                      | +++        | ++          | ++           | +       | +++          | +++            | ++           |
| Three and four-point contact                                                         | 1 row                       | ++ <sup>1)</sup>         | +++        | --          | ++           | -       | ++++         | ++             | +++          |
| Cylindrical roller bearings                                                          | 1 row                       | +++                      | -          | --          | +            | -       | ++++         | +++            | +++          |
|                                                                                      | 2 rows                      | +++                      | ++         | --          | +            | +       | +++          | ++++           | ++           |
| Tapered roller bearings                                                              | 1 row                       | ++++                     | +++ ←      | ++          | -            | -       | +++          | +++            | +            |
|                                                                                      | 2 rows pre-loaded           | ++++                     | +++        | ++          | +            | +       | ++           | ++++           | -            |
| Spherical roller bearings                                                            | 1 row                       | +++                      | ++         | --          | ++++         | ++      | ++           | +++            | ++           |
|                                                                                      | 2 rows                      | ++++                     | ++         | --          | ++++         | ++      | ++           | ++++           | ++           |
| ++++ excellent<br>+++ very good<br>++ good<br>+ fair<br>- poor<br>← single direction |                             |                          |            |             |              |         |              |                |              |

<sup>1)</sup> Must be combined with a higher axial load

# Sizes

Typical bearing sizes are from 8 mm (0.31 in.) bore to 800 mm (31.5 in.) outside diameter.

SKF Aerospace precision specialty balls have typical sizes from 0,7 to 64 mm (0.03 to 2.52 in.) in diameter.

# Tolerances

Common tolerance classes for SKF Aeroengine bearings are:

| ISO tolerance class <sup>1)</sup> | ABEC/RBEC equivalence | Description                                                                         |
|-----------------------------------|-----------------------|-------------------------------------------------------------------------------------|
| Normal                            | ABEC 1 or RBEC 1      | Minimum standard for all SKF Aeroengine bearings                                    |
| Class 6                           | ABEC 3 or RBEC 3      | Tighter tolerances than Normal                                                      |
| Class 5                           | ABEC 5 or RBEC 5      | Tighter tolerances than Class 6                                                     |
| Class 4                           | ABEC 7 or RBEC 7      | Tighter tolerances than Class 5                                                     |
| Class 2                           | ABEC 9                | Tighter tolerances than class 4, only used for specific high demanding applications |

<sup>1)</sup> Tolerance classes for radial bearings, and the corresponding values are specified in ISO 492 (Rolling bearings – radial bearings – tolerances).

In addition to bearings in accordance with standardized tolerance classes, SKF supplies bearings with customized tolerances. For more information, contact your regional SKF partner at [skf.com/go/aero](https://skf.com/go/aero).

SKF Aerospace precision specialty balls used in aeroengine bearings can be provided with tolerances compliant to ABMA or ISO grade 3 to 48.

# Special design features and options

- Flanges**  
Flanges are used for mounting and fixing the part to the application interface. This solution is especially suitable to avoid modification of the assembled fit and bearing torque when the materials used for the housing and shaft result in differing coefficients of thermal expansion.
- Customized features to accommodate vibration**  
Common features include flexible outer ring in steel with flanges and dampers (squirrel cages, squeeze films).
- Dismounting grooves**  
Aeroengine bearings are often mounted with an interference fit on the shaft. Inner rings with dismounting grooves facilitate maintenance operation, reducing time and improving safety.
- Lubrication grooves and holes**  
Bearings can be designed with customized lubrication grooves to direct the lubricant to the rolling contacts and improve bearing performance, or to facilitate oil drainage and reduce power loss.
- Anti-rotation features**  
Face slots or lugs can be used to locate the bearing rings in the housing.

For more information and more customized designs, contact SKF.

# Materials

## Materials of rings and rolling elements

SKF uses advanced premium quality metallic alloys, usually protected from the atmosphere and impurities by melting (or double melting) inside a vacuum container. The result is a cleaner, more uniform steel with the superior properties required for the most demanding applications.

Depending on the materials used, aerospace bearings can also be supplied with different heat treatments, such as through hardening or case hardening and with different surface treatments, such as carburizing and nitriding to meet specific application requirements.

Typical materials used for aeroengine bearings are displayed in **table 4**.

Rolling elements are made of steel (typically 52100, M50, or other corrosion-resistant steels) or ceramic. Ceramic rolling elements can be used when the application calls for:

- Light weight
- High stiffness
- Enhanced speed capability and reduced power loss
- Operation under very high temperatures and/or with exposure to contaminated environments.

## Materials of cages

Typical materials for cages are:

### Steel

Steel cages have high strength and can be used at elevated temperatures. Steel cages are standard for many aeroengine bearing designs. They are typically silver plated for enhanced friction performance, even with intermittently poor lubrication conditions.

### Brass

Brass is unaffected by most common bearing lubricants, including synthetic oils and greases. Brass cages can be used at operating temperatures up to 250 °C (482 °F).

Machined brass cages are typically used for ball and cylindrical roller bearings (single and double row), as well as for double row angular contact ball bearings.

Brass cages can also be silver plated for enhanced friction performance, even with intermittently poor lubrication conditions.

Other materials can be supplied by SKF for the cages, rings and rolling elements, customized to meet the most demanding application requirements.

Table 4

### Typical ring materials

| Material designation | Equivalent designation | AMS standards | Heat and surface treatment            | Corrosion resistance | Use for structural parts | Performance in contaminated environment | Performance in high temperature environment |
|----------------------|------------------------|---------------|---------------------------------------|----------------------|--------------------------|-----------------------------------------|---------------------------------------------|
| 52100                | 100Cr6 (100C6)         | AMS 6444      | Through hardened                      | +                    | +                        | +                                       | +                                           |
| M50                  | 80MoCrV42-16           | AMS 6491      | Through hardened<br>Nitrided          | +                    | +                        | ++                                      | ++                                          |
| M50-NiL              | C-13MoCrNiV40          | AMS 6278      | Carburized<br>Carburized and nitrided | +                    | +++                      | ++                                      | ++                                          |
| 9310                 | —                      | —             | Carburized                            | +                    | +++                      | ++                                      | +                                           |
| 32CDV13              | 32CrMoV13              | AMS 6481      | Nitrided                              | +                    | +++                      | ++                                      | ++                                          |
| Chromex40©           | X40CrMoVN16.2          | AMS 5925      | Through hardened                      | ++                   | +                        | +                                       | ++                                          |
| 440C                 | X105CrMo17 (Z100CD17)  | AMS 5618      | Through hardened                      | ++                   | +                        | +                                       | ++                                          |
| BG42©                | —                      | AMS 5749      | Through hardened                      | ++                   | +                        | +                                       | ++                                          |

+++ excellent  
++ good  
+ moderate

## Polyether ether ketone (PEEK)

Glass or carbon fibre reinforced PEEK is typically used for demanding applications where there are either high speeds or a need for chemical resistance. The maximum operating temperature is limited to 130 °C (266 °F). Excursions up to 200 °C (390 °F) can be allowed, contact SKF for more information.

For operation outside this temperature range, performance of the cage PEEK material and of the bearing can be reduced. Contact SKF for more information.

PEEK is typically used for angular contact ball bearings and for cylindrical roller bearings.

## Bearing remanufacturing

SKF is EASA Part 145 certified and SKF Bearing Remanufacturing Programme is designed to return a bearing to service in the shortest possible time, while ensuring the highest quality workmanship on a very cost-effective basis. Remanufacturing includes the necessary inspections and quality controls.

A bearing repaired by SKF performs like a new bearing, with the same warranty but at a significantly lower cost.

SKF can support the maintenance of all ball or roller bearings, by performing the required inspections, regardless of the original manufacturer.

## Storage

Aeroengine bearings are typically vacuum packed.

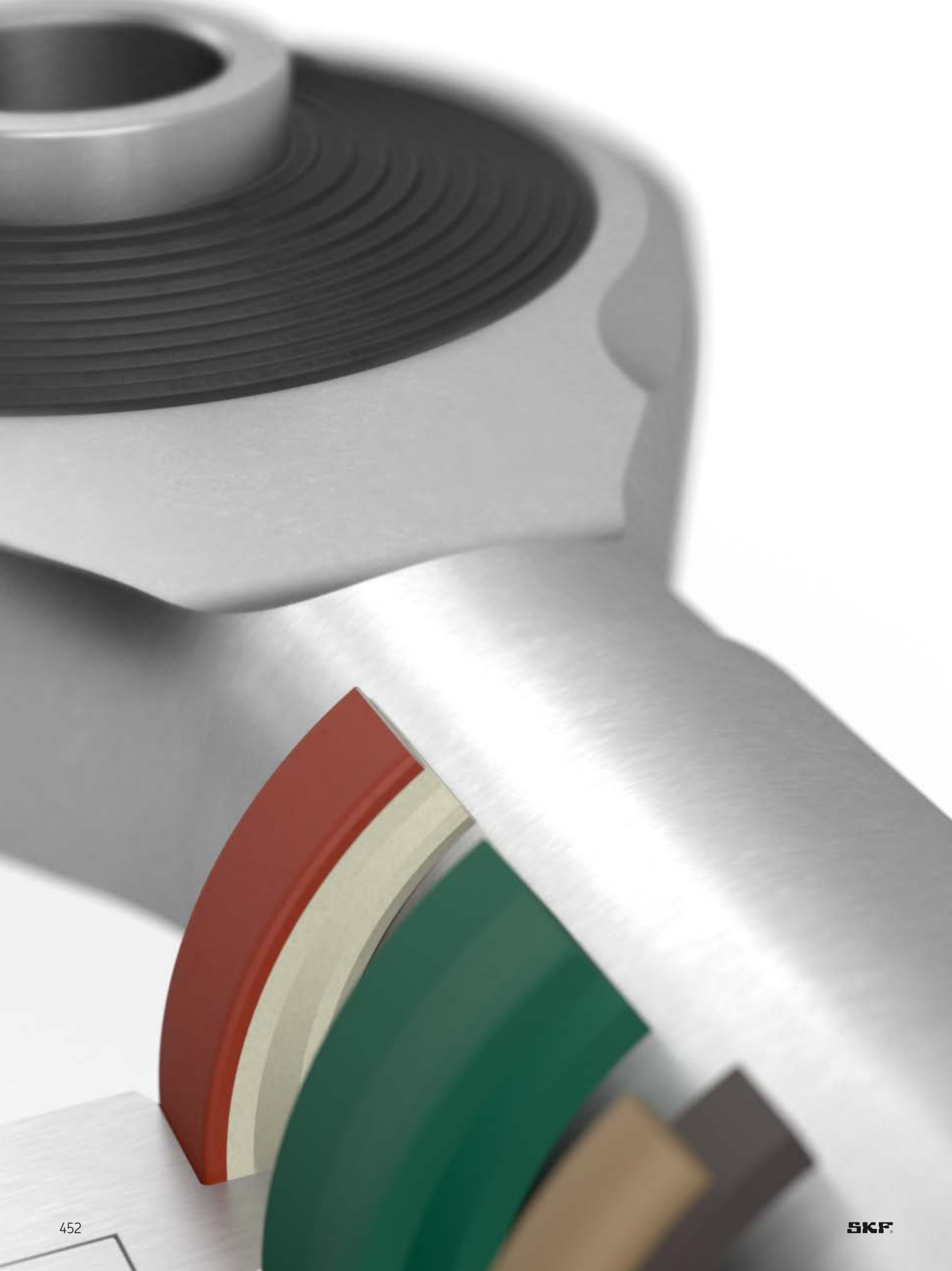
To maintain the integrity of the product during storage, SKF recommends the following practices:

- Practice a "first in, first out" inventory policy
- Store bearings flat, in a vibration-free, dry area with cool steady temperature.
- Keep bearings in their original packaging until immediately prior to mounting in application to prevent the ingress of contaminants and corrosion.
- Respect the recommended storage time indicated on the packaging. Standard storage life is five years maximum.

Beyond this limit, the ageing of the lubricant and of the packaging can lead to a reduced bearing protection and cause corrosion as well as bearing performance reduction. The bearing should therefore be inspected and reconditioned by SKF to increase the allowable storage time.







# C Other aerospace solutions

|                                                       |     |
|-------------------------------------------------------|-----|
| 9 Aerospace thin section bearings . . . . .           | 454 |
| 10 Aerospace specialty and engineered balls . . . . . | 462 |
| 11 Aerospace sealing solutions . . . . .              | 468 |
| 12 Elastomeric and damping solutions . . . . .        | 476 |



9

## Aerospace thin section bearings



# 9 Aerospace thin section bearings

|                                                             |            |
|-------------------------------------------------------------|------------|
| <b>SKF Real-Slim thin section bearings</b> . . . . .        | <b>456</b> |
| Sizes . . . . .                                             | 456        |
| Bearing types and common design features overview . . . . . | 457        |
| <b>Options</b> . . . . .                                    | <b>459</b> |
| Cage types . . . . .                                        | 459        |
| Sealing and shielding . . . . .                             | 460        |
| Materials . . . . .                                         | 460        |
| Rings and balls . . . . .                                   | 460        |
| Cages . . . . .                                             | 461        |
| Seals . . . . .                                             | 461        |
| Coatings . . . . .                                          | 461        |
| <b>Bearing remanufacturing</b> . . . . .                    | <b>461</b> |
| Engineered designs . . . . .                                | 461        |
| Ultra-Slim thin section bearings . . . . .                  | 461        |
| Other engineered designs . . . . .                          | 461        |

SKF is a leading manufacturer of thin section bearings, including the standard SKF Real-Slim product range, one of the most widely used thin section bearings in the world.

Such bearings have a cross-section that remains constant over the range of bore sizes. This is in sharp contrast to other bearings in which the cross-section increases as the bore diameter increases. The constant cross-section of thin section bearings is a suitable solution when designing products that vary in size depending on shaft diameter and power requirements.

SKF thin section bearing solutions save weight, create space, reduce friction, increase design flexibility and provide excellent running accuracy.

Space and weight savings of up to 85% can be achieved. Such savings are typically known to eliminate enough material and components to reduce system costs by up to 40%.

Despite their slim profile, thin section bearings have enough load capacity to meet the most demanding specifications in a wide range of aerospace applications, including target systems, navigation devices, helicopter swash plates and gearboxes, propulsion and control systems, radars, satellites, space rovers, etc. Thin section bearings are also suitable for many other applications in various industries, such as industrial machinery, oil and gas, medical and renewable energy.

SKF thin section bearings are available in the industry's largest variety of materials, cage options, cross sections, internal clearance or preload choices, lubricants, corrosion resistance options, contact angles, and precision levels.

In addition to the standard range of SKF Real-Slim products (page 456), SKF supplies both engineered designs (including SKF Ultra-Slim thin section bearings, see page 461) and customized designs.

Specific customization of thin section bearings can include changes in materials, sizes, tolerances, specifications, internal clearances, preload, lubricants (adapted to specific low torque requirements, operating temperatures, required moisture resistance, operation under vacuum etc.), packaging, etching of high points, tagging bearings with actual dimensions as requested, cages, duplexing, data sheets, acceptance testing, use of ISO class 7 facilities for cleanroom assembly etc. Contact SKF for more information.

SKF also supplies remanufactured bearings (refer to *Bearing remanufacturing* page 461).

For more information, go to: [https://www.kaydonbearings.com/downloads/210-603-Kaydon\\_Real-Slim\\_Bearing\\_Catalog\\_Apr-2020.pdf](https://www.kaydonbearings.com/downloads/210-603-Kaydon_Real-Slim_Bearing_Catalog_Apr-2020.pdf)

# SKF Real-Slim thin section bearings

## Sizes

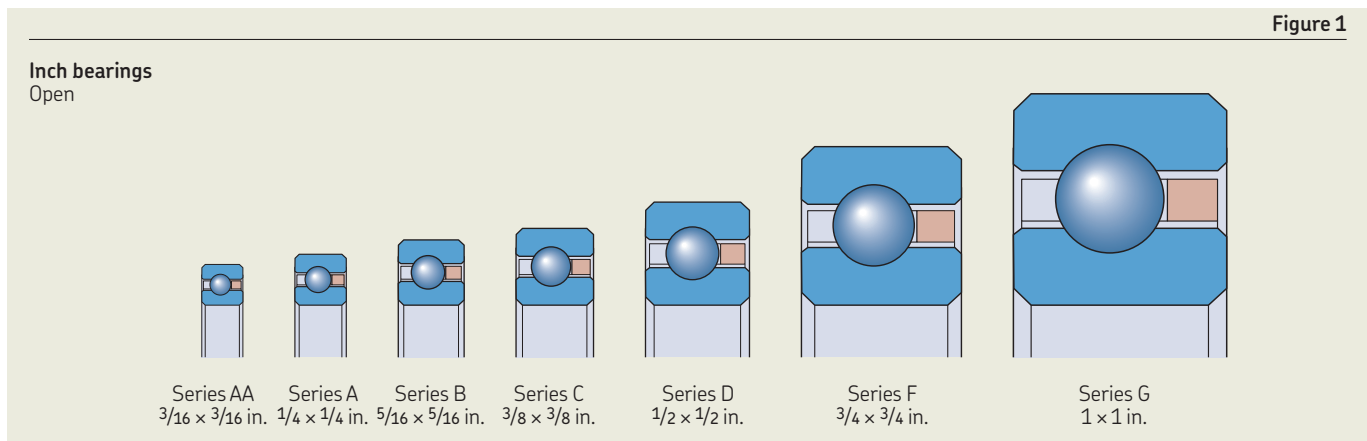
Each series of SKF Real-Slim thin section bearings is based on a single cross section, which remains constant as the bore diameter increases. By using the same series of thin section bearings throughout a product line, common components can be standardized and the bearing envelope can be conserved.

The inch dimensions family of SKF Real-Slim bearings includes seven open series (figure 1) and five sealed series (figure 2), ranging from 1.000 to 40.000 in. (25,4 to 1016,0 mm) bore diameters. These series range from 0.187 x 0.187 in. (4,7498 x 4,7498 mm) to 1.000 x 1.000 in. (25,4 x 25,4 mm) cross section.

For applications requiring metric boundary dimensions or for dimensional interchangeability with other products, SKF supplies the SKF Real-Slim mm series of bearings. They can be:

- Open or sealed (figure 3)
- In cross sections of 8 x 8 mm, 13 x 13 mm or 20 x 20 mm
- With bore diameters ranging from 20 mm to 360 mm

Figure 1



# Bearing types and common design features overview

To support various load scenarios (radial, axial and moment load), SKF Real-Slim bearings are available in three basic types: radial contact (Type C), angular contact (Type A), and four-point contact (Type X). Open bearings are available from stock in three configurations (Types A, C and X). Stock sealed bearings are available in Types C and X only. Refer to *Bearing types* **page 458**.

SKF provides options such as special lubricants, and materials including ceramic balls, as well as other features to meet the most demanding specifications. For enhanced corrosion resistance the SKF stainless steel SKF Real-Slim or Endura-Slim series of bearings can be used. Endurakote plating can also be used to provide corrosion protection equal to or better than a full 440C stainless steel bearing. Refer to *Materials and Coating* **pages 460 and 461**.

SKF supplies both open or sealed bearings. Sealing is used for applications where bearings can be exposed to damaging particulates. Refer to *Sealing and shielding* **page 460**.

SKF Real-Slim bearings are available with various cage options to space the rolling elements uniformly and prevent contact between them. Cage types include continuous ring “snap-over pocket”, continuous ring circular pocket, formed wire, toroid, polytetrafluoroethylene (PTFE) spacers, and spacer ball separators. Refer to *Cage types* **page 459**.

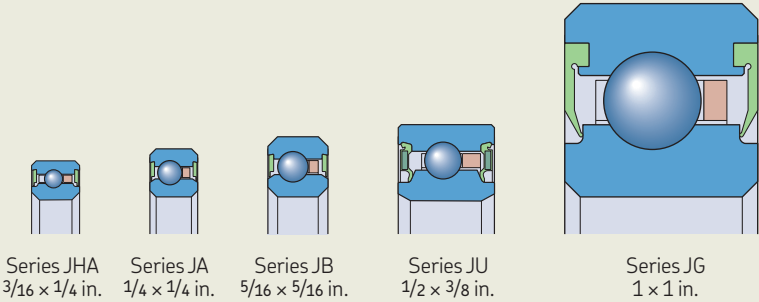
Bearings can be provided in a wide range of:

- Precisions, typically from class 1 per ABEC 1F to class 6 per ABEC 7F.
- Internal clearances, typically from 0.0000 to 0.0005 in. (0,000 to 0,127 mm), and up to 0.0050 to 0.0060 in. (0,127 to 0,1524 mm), or preload, typically from 0.0000 to 0.0005 in. (0,000 to 0,127 mm), and up to 0.0020 to 0.0030 in. (0,0508 to 0,0762 mm).

**Table 1, page 458** gives the key characteristics of the different types of SKF Real-Slim bearings.

Figure 2

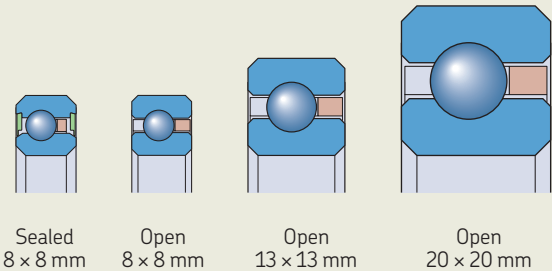
**Inch bearings**  
Sealed



9

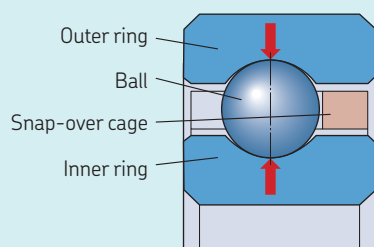
Figure 3

**Metric bearings**



## Bearing types

### Radial contact bearing (Type C)

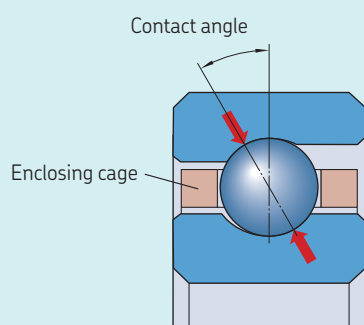


### Description

A single row radial ball bearing of conventional design. It is a Conrad-type assembly, which means that it is assembled by eccentric displacement of the inner ring within the outer ring which permits insertion of about half of a full complement of balls.

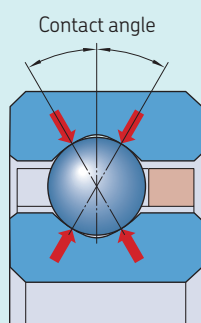
Although the Type C bearing is designed primarily for radial load application, it can be configured to accept some axial (thrust) load in either direction. But, if thrust is a concern, a set of angular contact bearings should be considered for the specific application.

### Angular contact bearing (Type A)



A deep groove bearing with reduced shoulder on one side of inner or outer ring raceways. The Type A bearing is also a conventional design. It features a circular pocket cage and a  $30^\circ$  contact angle along with approximately 67% of a full complement of balls. The chief benefit of the Type A bearing is that it provides greater thrust capacity than a Type C or Type X bearing. Because of its counterbored outer ring, a Type A bearing has unidirectional thrust capacity. Thus, this bearing should be mounted in opposition to another bearing to establish and maintain the contact angle, and to support reversing thrust loads.

### Four-point contact bearing (Type X)



Standard bearing products are most often designed to handle either radial or axial loading conditions. The unique feature of the Reali-Slim Type X four-point contact bearing is that the gothic arch geometry of the inner and outer rings enables a single bearing to carry three types of loading (radial, axial and moment) simultaneously if needed. This makes it the bearing of choice for many applications since a single four-point contact bearing can often replace two bearings, providing a simplified design. Type X bearings may also be furnished with an internal diametral preload for those applications requiring greater stiffness or zero free play. This is accomplished by using balls that are larger than the space provided between the raceways. The balls and raceways, therefore, have some elastic deformation in the absence of an external load.

**NOTE:** SKF does not recommend the use of two Type X bearings on a common shaft, as it could result in an unacceptable frictional moment.



# Options

## Cage types

The principal function of a bearing cage is to space the rolling elements uniformly to prevent contact between them. This is to avoid abrasion of the rolling elements and reduce bearing wear that could affect life and torque characteristics.

Typical cage designs include:

- The commonly used standard continuous ring “snap-over pocket” cage (**figure 4**)
- Continuous ring circular cages, when a larger number of rolling elements is required (**figure 5** and **figure 6**)
- Formed wire cage, when maximum capacity is required. This enables the greatest possible number of balls on Type A bearings (**figure 7**).

In some critical positioning applications, uniformity of torque is more important than the actual mean torque level. Specially designed toroids (**figure 8**), PTFE spacer slugs (**figure 9**), spacer balls (**figure 10**) or helical compression springs (**figure 11**) have proven in a number of such instances to be satisfactory for ball separation – by their nature they give a large amount of individual and cumulative circumferential freedom to the balls. To prevent this freedom from being detrimental, the rotational speeds must be kept low and loads comparatively light.

SKF can support the selection of the most appropriate cage or spacer solution. Contact your regional SKF Aerospace partner at: [skf.com/go/aero](mailto:skf.com/go/aero)

Figure 4

Continuous ring “Snap-over pocket” cage

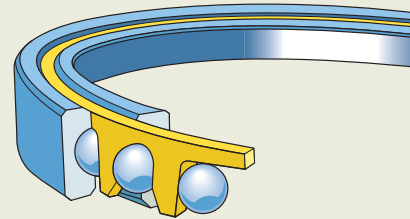


Figure 5

Continuous ring pocket cage

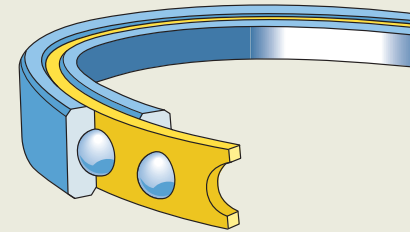


Figure 6

Riveted ring circular pocket cage

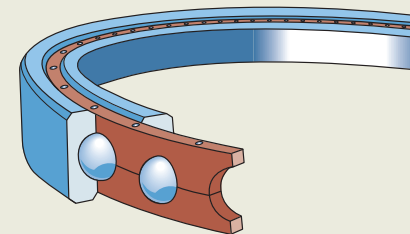


Figure 7

Formed wire cage

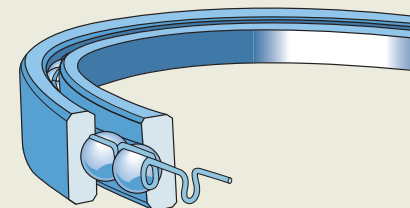


Figure 8

Toroid spacer

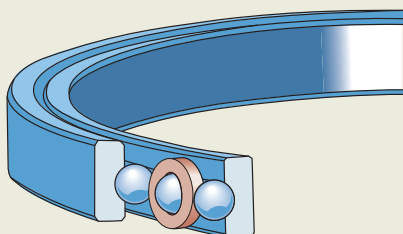


Figure 9

PTFE spacer slugs

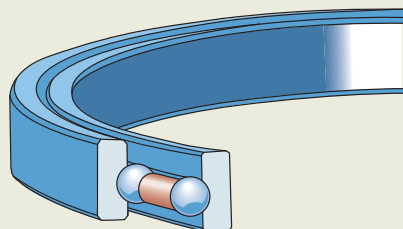


Figure 10

Spacer balls

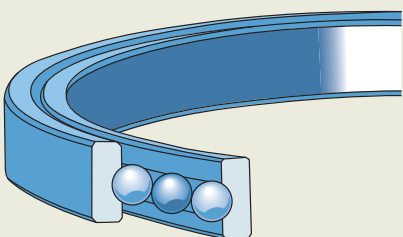
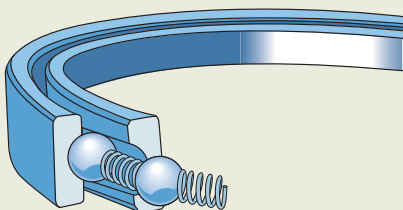


Figure 11

Helical spring



## Sealing and shielding

For optimum performance of SKF Real-Slim thin section bearings, it is important to keep them clean and well lubricated. Properly designed and mounted seals and shields help accomplish this.

A sealing solution creates a contacting closure between the stationary and rotating parts. Seals are retained in the outer ring and make positive contact with the inner ring.

A shielding solution also creates a closure but without positive contact.

Seals are more effective to retain the lubricant within and exclude contamination from the bearing. But sealing increases bearing torque, generates more heat, and as a result, sealed bearings have a lower speed limit than an open or shielded bearing. Integral seals and shields offer a very compact overall design with the additional advantage of protecting the bearing before, during and after installation.

Where application requires a low weight compact solution, and when a seal or shield is required on one side only, single-sealed or single-shielded bearings are available as custom options.

**NOTE:** Sealed Real-Slim bearings are pre-lubricated with a general-purpose grease. Operating conditions (i.e. time, temperature, speed, environment) may result in premature lubrication degradation. A variety of lubricants are available as options to meet the most demanding application requirements.

## Materials

### Rings and balls

Rings and balls are made of 52100 type steel per ASTM A-295 or of 440C stainless steel per AMS 5630 when better corrosion resistance is required.

Stainless steel is typically required when the bearing needs to:

- Operate in close proximity to corrosive chemicals
- Operate with lubricants which do not protect against corrosion
- Be ready-to-use, ultra-clean bearings with no preservative on them

440C stainless steel meets a minimum of 58 HRC hardness level and can support the same loading as 52100 steel.

Rolling elements can also be provided in ceramic material. Such bearings are generally referred to as hybrid bearings. The physical properties of the ceramic rolling elements (precision, hardness, light weight) provide additional benefits such as improved repeatability, low torque, high stiffness, and resistance to wear under marginal or no-lube conditions.

In applications where both corrosion resistance and chemical resistance are required, P series bearings may be required. These bearings have rings made of 17-4PH stainless steel and have ceramic balls.

Standard bearings are processed for operating temperatures up to 121 °C (250 °F). At temperatures above this limit, reductions in material hardness can affect bearing capacity, which will reduce the bearing's dynamic life. When full capacity is required at higher temperatures, the use of M series bearings may be required.

Manufactured from M50 tool steel for balls and rings and assembled with stainless steel cages, these bearings can provide full bearing capacity at temperatures greater than 121 °C (250 °F). However, careful consideration to the bearing lubricant must also be taken.

## Cages

Cages are made of brass, stainless steel, non-metallic materials such as phenolic laminate, PTFE, and polyether ether ketone (PEEK) or other materials depending on operating conditions.

Stainless steel cages are used in stainless steel bearings or high temperature applications for corrosion resistance. Non-metallic cages are used where light weight and/or lubricant absorption are required.

## Seals

Seals are typically made of nitrile rubber. For operation at high temperatures or in contaminated environments, silicone or Viton materials can be used.

## Coatings

Endurakote plating protects bearings from corrosion and provides substantial life improvements in contaminated environments. Endurakote plating is applied over conventional bearing materials such as 52100 steel and offers the same corrosion resistance as bearings made of 440C stainless steel. The coating is applied to the entire bearing ring surface, including the raceways, leaving no area unprotected from corrosion. Endurakote plating is hard chromium, electrodeposited by a proprietary process. The hard, dense exterior surface formed by the coating is excellent in the retention of the lubricant film and is extremely wear resistant. Endurakote plating achieves a true molecular bond, and will not flake or peel even under the high contact stresses experienced in the bearing contacts.



# Bearing remanufacturing

The SKF Bearing Remanufacturing Programme is designed to return a bearing to service in the shortest possible time, while ensuring the highest quality workmanship on a very cost-effective basis. Remanufacturing includes the necessary inspections and quality controls.

A bearing repaired by SKF performs like a new bearing, with the same warranty but at a significantly lower cost.

Bearings with bores as small as 250 mm (10 in.) and bearings with outer diameters as large as 6 100 mm (240 in.) can be remanufactured. SKF remanufacturing solutions extend to all ball and roller bearings, regardless of the original manufacturer.

## Engineered designs

### Ultra-Slim thin section bearings

Ultra-Slim bearings have an extremely thin cross section that provides great size and weight reductions for light to medium duty applications with slow or intermittent rotation.

They are used for applications in aerospace, robotics or anywhere precise positioning and lightweight designs are critical. At just 2,5 mm (0.1 in.) wide, Ultra-Slim bearings are available in bore sizes ranging from 35 to 170 mm (1.38 to 6.7 in.). Their compact profile allows the use of Ultra-Slim bearings in many highly confined spaces. Ultra-Slim bearings are made of stainless steel for corrosion resistance. They are available as angular contact (Type A), radial contact (Type C), and four-point contact (Type X) bearing types.

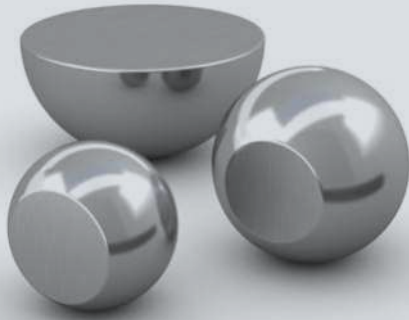
Hybrid bearings with ceramic balls are available on request. These are often used when lubrication is marginal or when lower wear generation and/or lower torque levels are required.

### Other engineered designs

SKF supplies other engineered thin section bearing designs, including:

- Metric ball bearings four-point contact BB series, typically used as an alternative to cross-roller bearings
- SKF Reali-Slim TT series, four-point contact, small scale, thin section turntable bearings
- Tapered roller bearings KT series, single row radial type

For other engineered and customized designs, contact SKF.



10

# Aerospace specialty and engineered balls



# 10 Aerospace specialty and engineered balls

|                                  |                |
|----------------------------------|----------------|
| <b>Products</b> .....            | <b>464</b>     |
| Flatted balls.....               | 464            |
| Hollow balls.....                | 464            |
| Ball plugs.....                  | 465            |
| Tooling and checking balls ..... | 465            |
| Master ball sets.....            | 465            |
| <br><b>Materials</b> .....       | <br><b>466</b> |
| <br><b>Ball grades</b> .....     | <br><b>467</b> |

In addition to supplying precision aerospace specialty balls, typically used for rolling bearings (refer to *Airframe rolling bearings* **page 30** and *Aeroengine rolling bearings* **page 444**), SKF supplies other types of balls in a wide range of materials, sizes and grades, engineered to meet many different aerospace and industrial applications.

Flatted balls, hollow balls and ball plugs are used in fluid and flow control applications. For measurement and positioning, SKF supplies tooling and checking balls, and master ball sets.

SKF also supplies a wide range of customized ball designs to meet the most demanding application requirements.

## Products

### Flatted balls

Flatted balls are typically used in fluid and flow control devices such as valve stems. They can also be used as shoes in rotating equipments, such as swash plate shoes. They can be supplied in a wide range of materials and sizes: 1,5 mm to 63,5 mm ( $\frac{1}{16}$  to 2.5 in.) diameter. Some examples are given in **figure 1**.

### Hollow balls

Hollow balls are typically used in ball transfer units and fluid control devices such as fluid and tank valves. They can be supplied in a wide range of materials and sizes: 9,525 mm to 63,5 mm ( $\frac{3}{8}$  to 2.5 in.) diameter. See **figure 2**.

Figure 1

Flatted balls



Figure 2

Hollow balls



# Ball plugs

Ball plugs are typically used during the investment casting process of airfoils and blades, where tubular channels or vent holes in the casting are plugged by ball elements.

Ball plugs can be customized to application requirements. SKF supplies any increment of sizes from 1,5 to 25,4 mm (*1/16 to 1 in.*) diameter.

Typical materials used for ball plugs include nickel alloyed steels such as Hastelloy. For more information, refer to *Materials* page 472.

See example in **figure 3**.

# Tooling and checking balls

SKF tooling and checking balls are extensively used as metrology tools. They can be supplied in many metric or inch sizes. They are typically made of high precision finely finished 440C stainless steel material with hardness 55 to 58 HRC.

Designs can include:

- A reference shoulder for positive positioning and re-positioning.
- A shank that can be press-fitted into a hole.

Some examples are given in **figure 4**.

# Master ball sets

Master ball sets are extensively used as metrology tools for close-tolerance measurements. SKF ball sets have the necessary certifications, including that of the National Institute of Standards and Technology.

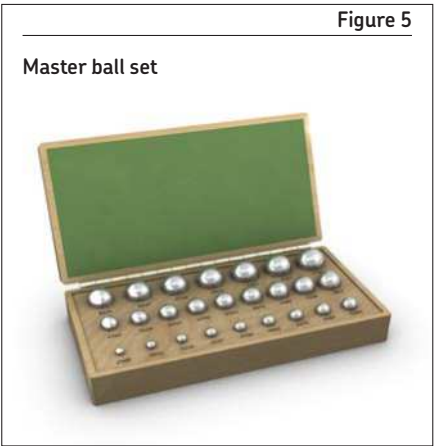
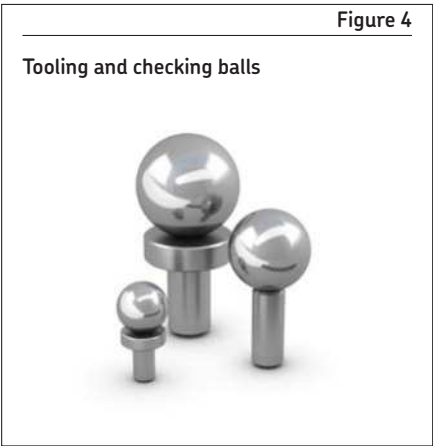
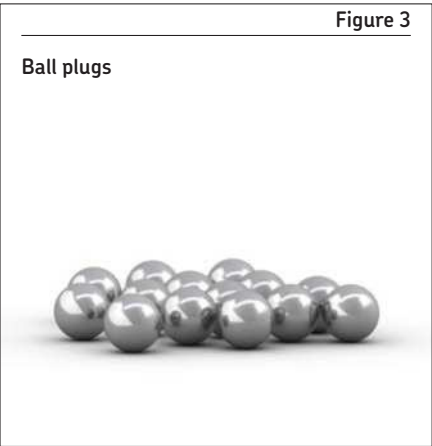
Typical applications include checking of flatness and parallelism, as well as depth and diameter measurements.

Materials used are highly corrosion resistant, humidity resistant and abrasion resistant, such as tungsten carbide tool steel.

The following specifications are supplied :

| Specification      | Inch set                                                                                              | Metric set                                           |
|--------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Size range         | 1/16 to 1 in. (1,5875 to 25,4 mm) diameter in 1/32 in. (0,79375 mm) increments, with 31 balls per set | 1 to 25 mm in 1 mm increments, with 25 balls per set |
| Diameter tolerance | ±0.000010 in. (0,254 µm)                                                                              | ±0,3 µm                                              |
| Sphericity         | 0.000010 in. (0,254 µm)                                                                               | 0,2 µm                                               |
| Micro-finish       | 1 µin. (0,0254 µm)                                                                                    | 0,02 µm                                              |
| Hardness HRA       | 88 to 92                                                                                              | 88 to 92                                             |

Some examples are given in **figure 5**.



# Materials

SKF supplies balls in a wide range of materials, designed to meet a variety of needs, including:

- **52100 steel**

The standard material for most off-the-shelf balls, with excellent strength characteristics and the capability to withstand moderate impact loading conditions. With suitable through-hardened heat treatment, 52100 steel can be used at operating temperatures up to 200 °C (400 °F).

- **Tool steels such as M50 steel**

Suitable for temperatures between 200 and 427 °C (400 and 800 °F), M50 steel maintains its hardness, capacity and thermal stability better than standard bearing steels in high-temperature applications. The vacuum arc re-melting process used to produce M50 steel results in extremely clean material that is highly resistant to wear and oxidation, offers consistent metallurgical properties, and maintains a typical hardness range of 60 to 65 HRC.

This material can be nitrided (M50-NiL steel) for greater fracture toughness that makes it ideal for high-temperature applications that also involve high shock loading conditions.

- **440C stainless steel**

This high carbon chromium steel is designed to provide maximum hardness in stainless ball applications. When heat treated, 440C stainless can attain 63 HRC hardness.

Balls made of 440C stainless perform exceptionally well in corrosive environments. When treated with a low-temperature process using liquid nitrogen, they can maintain their stability at temperatures down to nearly -185 °C (-300 °F).

- **Silicon nitride**

The characteristics of silicon nitride make it ideal for use in applications where high speed, high temperature, low operating noise, electrical insulation, high stiffness and high hardness are required. As a result, ceramics balls offer significant advantages over traditional materials when used in rolling bearings, ball valves, gage tips and ballizing applications.

SKF has pioneered the use of silicon nitride balls by developing a unique production process and the quality control procedures required to reliably manufacture high precision, ceramic rolling elements.

The result of this process is exceptional quality and reliable performance.

- **Other materials for specific applications**

Other corrosion-resistant steels and tool steels (including tungsten carbide tool steel), nickel based alloys (including Inconel or Hastelloy) or cobalt alloyed steel for high temperature applications, non-metallic (including nylon, typically used for lightweight solutions) and glass materials, titanium alloys, etc.



# Ball grades

SKF Aerospace specialty balls can be supplied with tolerances compliant to ABMA grade 3 to 1000. See **table 1** for more information.

**Table 1**
**SKF Aerospace specialty ball grades**

| ABMA grade | Ball diameter tolerance     | Spherical form uniformity tolerance | Basic diameter tolerance   | Surface roughness |
|------------|-----------------------------|-------------------------------------|----------------------------|-------------------|
|            | $\mu\text{in.}/\mu\text{m}$ |                                     |                            |                   |
| 3          | 3/0,08                      | 5/0,13                              | $\pm 30$<br>$\pm 0,75$     | 0.5/0,012         |
| 5          | 5/0,13                      | 10/0,25                             | +50/-40<br>+1,25/-1,00     | 0.8/0,020         |
| 10         | 10/0,25                     | 20/0,50                             | +50/-40<br>+1,25/-1,00     | 1.0/0,025         |
| 16         | 16/0,40                     | 32/0,80                             | +50/-40<br>+1,25/-1,00     | 1.0/0,025         |
| 24         | 24/0,60                     | 48/1,20                             | $\pm 100$<br>$\pm 2,50$    | 2.0/0,050         |
| 48         | 48/1,20                     | 96/2,40                             | $\pm 200$<br>$\pm 5,00$    | 3.0/0,080         |
| 100        | 100/2,50                    | 200/5,00                            | $\pm 500$<br>$\pm 12,50$   | 5.0/0,125         |
| 200        | 200/5,00                    | 400/10,00                           | $\pm 1000$<br>$\pm 25,00$  | 8.0/0,200         |
| 500        | 500/13,00                   | 1000/25,00                          | $\pm 2000$<br>$\pm 50,00$  | – 1)              |
| 1000       | 1000/25,00                  | 2000/50,00                          | $\pm 5000$<br>$\pm 125,00$ | – 1)              |

1) Not applicable



11

## Aerospace sealing solutions



# 11 Aerospace sealing solutions

|                                                         |            |
|---------------------------------------------------------|------------|
| <b>Product range</b> .....                              | <b>470</b> |
| <b>Materials</b> .....                                  | <b>470</b> |
| <b>Sealing rings</b> .....                              | <b>471</b> |
| <b>Aerospace carbon seals for turbine engines</b> ..... | <b>472</b> |
| Applications .....                                      | 472        |
| <b>Radial shaft seals</b> .....                         | <b>472</b> |
| <b>Diaphragm seals and boots</b> .....                  | <b>473</b> |
| <b>Cassette seals</b> .....                             | <b>473</b> |
| <b>Wear sleeves</b> .....                               | <b>473</b> |
| SKF Speedi-Sleeve .....                                 | 473        |
| SKF Speedi-Sleeve Gold .....                            | 473        |
| Custom designed wear sleeves .....                      | 473        |
| <b>Hydraulic seals</b> .....                            | <b>474</b> |
| Piston seals .....                                      | 474        |
| Rod and buffer seals .....                              | 474        |
| Wiper seals .....                                       | 474        |
| Guide rings .....                                       | 474        |
| <b>Fluid handling seals</b> .....                       | <b>475</b> |
| SKF Spectraseal .....                                   | 475        |
| Rotary manifold seals .....                             | 475        |
| Locking T-seals .....                                   | 475        |

SKF supplies a wide range of sealing solutions, from seal replacement to the design of customized seals for extremely demanding applications. This is enabled by SKF's unmatched understanding of the interaction between seals, bearings, lubrication and operating conditions (temperatures, speeds, pressures, etc.).

With unique capabilities in seal design, materials, testing and manufacturing, SKF sealing solutions meet the most demanding application requirements. They can be found in power transmission systems, actuators, pumps and fluid handling systems.

SKF supports the entire product life cycle with:

- SKF simulation tool for seals, used to explore the non-linear behaviour of various sealing materials and designs. This helps to predict sealing performance under various operating conditions.
- Tests that can be conducted on-site at your location, or at one of our global testing facilities. Seals can be tested in static or dynamic loading conditions using rotating and reciprocating test rigs capable of simulating operating conditions including extreme pressures and temperatures. SKF testing capability also includes tests of durability, performance, contaminant exclusion, salt fog corrosion, cold fracture, pump rate, frictional moment, dry wear, and chemical compatibility.  
For example, SKF has made significant investments in high speed test rigs for carbon seals to allow demonstration testing of new designs and validation testing of design changes. Testing is performed to match flight profiles for engine applications under simulated flight conditions.  
Results from thousands of seal tests conducted by SKF annually, generate valuable know-how for failure analyses and performance optimization.
- High manufacturing flexibility. SKF manufacturing capability includes both moulded (in compression, injection or transfer) and machined seals. SKF manufactures seals on demand and delivers them worldwide and in quantities ranging from a few parts (prototypes for example) to serial production.

## Product range

Aerospace seals are available in a wide range of designs and materials, for applications from the smallest gearbox to the largest swash plate.

SKF's assortment comprises many products that meet international and customer standards including ISO, ASTM, or DIN standards.

When needed, a combination of different seals and arrangements can be used to achieve best sealing performance in complex operating conditions.

## Materials

Aerospace seals are exposed to a wide range of challenging operating conditions such as high temperature, speed, pressure and contact with chemicals. To handle these and other harsh conditions, it is essential to select the most suitable sealing materials.

To meet the most demanding application requirements, SKF sealing solutions use a wide range of rubbers, thermoplastic elastomers and other materials such as high-performance plastics:

- **Thermoset elastomers**

Extremely flexible materials that can be stretched and deflected with relatively little force. Many of them deliver excellent resistance to oils, greases, or other media.

- **Thermoplastic elastomers**

Thermoplastic elastomers offer advantages typical of both rubber and plastic materials. SKF's high performance polyurethanes (TPU) combine excellent abrasion and wear resistance, low compression set and tear strength, and outstanding pressure resistance.

- **PTFE**

Engineered to handle extreme conditions, polytetrafluoroethylene (PTFE) and its compounds can withstand aggressive chemicals plus high temperatures and pressures. Thanks to their extremely low coefficient of friction, they can also tolerate dry running conditions.

- **Carbon**

Carbon is typically used for applications with very high-speed and high-temperature rotary sealings, as in aircraft engine and auxiliary power unit (APU) main shafts. In such extreme operating conditions, elastomer, thermoplastic or PTFE materials may not be adequate.

- **Plastics**

From engineering plastics to high performance plastics such as polyether ether ketone (PEEK), SKF's range of specialty plastic materials can meet higher temperature, chemical and mechanical property requirements.

- **Other materials**

Including rubbers and metals. SKF also constantly develops solutions that are uniquely engineered for high performance applications, such as ECOPUR thermoplastic polyurethane, a proprietary SKF material.

# Sealing rings

SKF is a major designer and manufacturer of sealing rings, used to meet the most demanding application requirements.

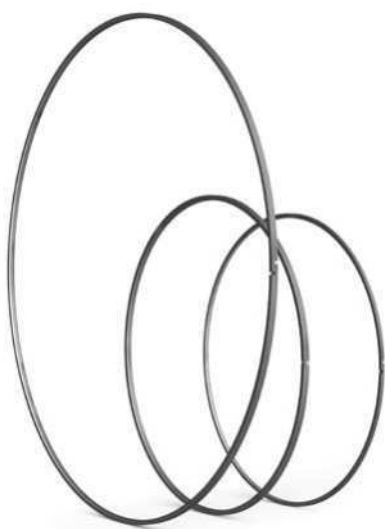
SKF sealing rings are specified for a broad range of static and dynamic aerospace applications including:

- Turbine engine bearing damper
- Piston engines
- Secondary seals in carbon seal assemblies
- Actuators
- Auxiliary power units (APU)
- Environmental control units
- High temperature valve applications

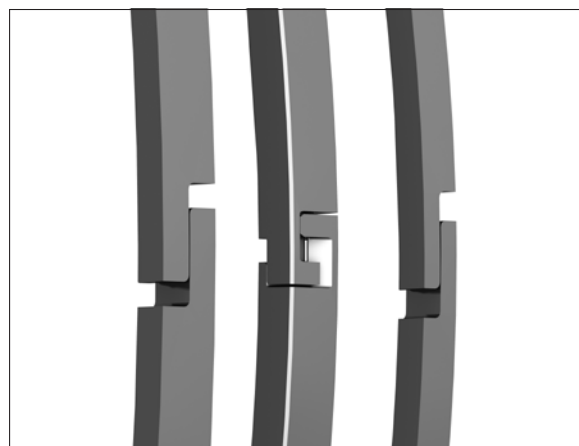
Patented joint configurations are available for applications requiring the strictest leakage control and for blind assembly applications. Various coatings are also used and are specified based on the needs of the application.

For sealing rings, SKF provides a proprietary AMS 7310 iron. This is a preferred ring material for many aircraft engine applications with a proven history of superior performance characteristics. Metallic ferrous rings, high temperature alloys such as Inconel, and thermo-plastic and thermoset non-metallic materials can also be supplied. For example, SKF's proprietary PTFE blends can be used for optimum wear and sealing efficiency to meet specific application requirements.

SKF designs and supplies the optimum sealing ring solution for your application to ensure long life, performance and reliability.



*Sealing rings*



*Sealing ring solutions*

# Aerospace carbon seals for turbine engines

Carbon seals reduce costs by extending life and delivering outstanding performance in harsh operating conditions, setting quality standards for many commercial and military engines.

## Applications

- Main shaft bearing seals in aircraft engines
  - Bearing compartment face seals
- Bearing compartment circumferential seals
- Bearing compartment bushing seals
- Main engine bearing compartment seals
  - Turbine engine shaft seals to seal the main shaft bearing compartment and oil sump
- Air seals
- APU seals
- Auxiliary gear box seals
- Engine seals

SKF carbon seals can be designed with features providing hydrodynamic capability. Such features have shown clear performance advantages in reducing heat generation and extending seal life, reducing load on engine oil management systems and maximizing time on wing.

SKF carbon seals can be supplied with shaft seal runners. Runners are used to interface with the seal. They have a fine surface finish and surface treatment to ensure optimum performance. SKF also supplies other support structures and spacers to the sealing assemblies to assure the proper interface of mating components.

# Radial shaft seals

SKF supplies an array of proven shaft sealing solutions that protect bearings, keep lubricants in and improve system reliability.

At work in power transmissions across aerospace and every major industry, SKF radial shaft seals support greater uptime in everything from the smallest high-speed machine tools to the largest wind turbines.

SKF rubber and metal outside diameter shaft seals resist aggressive aerospace oils and can be designed with hydrodynamic features to optimize the functionality of the seal. Such designs are moulded in geometries that induce a hydrodynamic pumping action that allows the temperature under the lip to remain lower and reduces the carbonization of oil at the main sealing surface.

11



Carbon seals



Radial shaft seals

## Diaphragm seals and boots

Diaphragm seals are used for sealing across a shaft or inner member to the housing. They handle the torsional motion or oscillation of the shaft.

Boots are used for sealing in applications with reciprocation or torsional motion.

Diaphragm seals and boots are thin walled products with unique convoluted shapes. They are used for contamination exclusion in dynamic applications with torsional and/or rotational motion.

SKF offers a wide range of materials to meet the most demanding applications requirements.

## Cassette seals

Cassette seals are multi-component seals that provide an optimized sealing counterface by incorporating a wear sleeve (refer to *Wear sleeves* for more information). It uses high-performance elastomeric materials and allows for the inclusion of multi-lip designs to improve contamination exclusion and sealing performance.

## Wear sleeves

Over time, contaminants, high pressure and speed, or inadequate lubrication can cause particles to be trapped underneath a shaft sealing lip. Wear grooves begin to form on the shaft as it rotates, eventually leading to sealing failure and severe shaft damage. Repairs usually involve dismounting, replacing or re-machining the shaft, and installing a new seal. SKF Speedi-Sleeve and custom designed wear sleeves offer a much faster, more cost-effective alternative.

## SKF Speedi-Sleeve

SKF Speedi-Sleeve is a thin-walled wear sleeve that is simply pressed into position over the shaft to provide an excellent sealing surface for radial shaft seals. In fact, its surface properties result in a better counterface than what can normally be achieved on a shaft. Whether it is used to reduce initial shaft machining expenses or to limit downtime costs while repairing a worn shaft, SKF Speedi-Sleeve offers enhanced sealing system performance and benefits for both OEM and aftermarket customers – without the need to change the original seal size.

SKF Speedi-Sleeves are made of a proprietary stainless steel material, providing increased strength and excellent ductility properties. Imperceptible lubricant pockets enable the lubricant to reside on the sleeve and prevent dry running of the sealing lip that otherwise can create excessive wear.

## SKF Speedi-Sleeve Gold

SKF Speedi-Sleeve Gold is an enhanced version of the standard SKF Speedi-Sleeve, offering improved resistance to abrasive wear. Designed for applications where extended sealing system life is needed, SKF Speedi-Sleeve Gold bridges the performance gap between the standard sleeve and expensive custom shaft treatments. A thin, metallic coating applied to the base stainless steel imparts a gold colour and significantly increases durability. SKF Speedi-Sleeve Gold is particularly effective in environments where there are abrasive contaminants, especially when combined with a seal manufactured from the SKF fluoro rubber material, SKF Duralife.

## Custom designed wear sleeves

Designed in various thicknesses and diameters to suit the application, these replaceable wear sleeves are manufactured with the correct surface finish to ensure optimum performance from the sealing system.



*Diaphragm seal and boot*



*Cassette seal*



*Wear sleeves*

# Hydraulic seals

For fluid power applications like hydraulic cylinders, seals have to withstand extreme operating conditions and high-power density demands. SKF can meet these requirements with highly engineered designs and proprietary material formulations that provide outstanding mechanical properties and excellent chemical compatibility with various hydraulic fluids.

## Piston seals

Piston seals maintain sealing contact between the piston and the cylinder bore. Optimized for single and double-acting cylinders, piston seals prevent leakage past the piston while allowing an oil film to minimize friction and wear. The SKF piston seal profiles can feature:

- Polyamide/nitrile, polyurethane materials or SKF's proprietary X-ECOPUR PS material, developed specifically for piston seals
- Step-shaped split for easy installation and effective sealing for high pressure applications
- Optimized dynamic surface profiles and side vent notches

## Rod and buffer seals

Rod and buffer seals maintain sealing contact in sliding motion between the cylinder head and the piston rod. SKF has a wide range of rod and buffer seals to prevent failures and boost system reliability.

Designed for heavy-duty applications, rod seals are typically single lip and made of SKF's proprietary ECOPUR thermoplastic polyurethane.

Designed to protect the rod seal from system pressure spikes, SKF buffer seals support rod seal functionality and longer hydraulic cylinder service life. They are typically U-cup designs suitable for heavy-duty applications.

## Wiper seals

SKF wiper seals prevent contaminants from being transported into the system with the reciprocating piston rod.

SKF supplies single-acting press-in profiles, widely used in applications with heavy contamination. For snap-in applications, SKF supplies solutions featuring the functional benefits of a press-in seal, but with snap-in convenience and better rod tracking.

## Guide rings

Non-metallic SKF guide rings accommodate radial loads acting on the cylinder assembly, prevent wear and guide the rod in the cylinder head as well as the piston in the cylinder bore to avoid damage. This can lead to smoother operation and longer service life.

SKF polymeric material guides are precision machined and available in reinforced polyamide, phenolic resin and fabric or PTFE, and deliver substantial improvements in seal life and sealing performance. For heavy duty applications, SKF guide rings include piston guide rings, rod guide rings or solutions that can be used in either rod or piston applications.

11



*Piston seals*



*Rod and buffer seals*



*Wiper seals*



*Guide rings*



## Fluid handling seals

For fluid handling applications where seals come into direct contact with aggressive fluids or slurries, SKF supplies sealing solutions that can withstand these harsh conditions.

### SKF Spectraseal

The SKF Spectraseal product line is used when conventional elastomer or thermoplastic seals cannot withstand temperature extremes from cryogenic temperatures of  $-193$  to  $+290$  °C ( $-315$  to  $+550$  °F), aggressive chemicals and solvents, abrasive or non-lubricating media, high surface speeds and/or high pressures. SKF Spectraseal are seals machined from engineered plastic materials such as PTFE-based compounds, ultra-high molecular weight polyethylene (UHMWPE), PEEK and other high performance plastics. They are also available in materials with a very low coefficient of friction, enabling sealing at high surface speeds in dry or non-lubricated conditions while reducing linear or rotating friction.

### Rotary manifold seals

SKF rotary manifold sealing solutions maintain proper fluid flow between machine components for virtually any application, including those optimized for low friction to enable greater energy efficiency and service life.

### Locking T-seals

The Locking T-seal is an SKF patented design where a ridge on the hard plastic anti-extrusion ring is able to snap into a groove moulded or machined into the elastomer lip, locking the T-seals anti-extrusion ring in the right position.

Locking T-seals from SKF enable easier assembly and less risk of damage, even in remote locations or with automated equipment. The seals feature ridges that snap into place when installed and mechanically lock the anti-extrusion rings in the proper orientation. The seals can also be used in dynamic reciprocating applications, as well as high-pressure static connections.



*SKF Spectraseal*



*Rotary manifold seals*

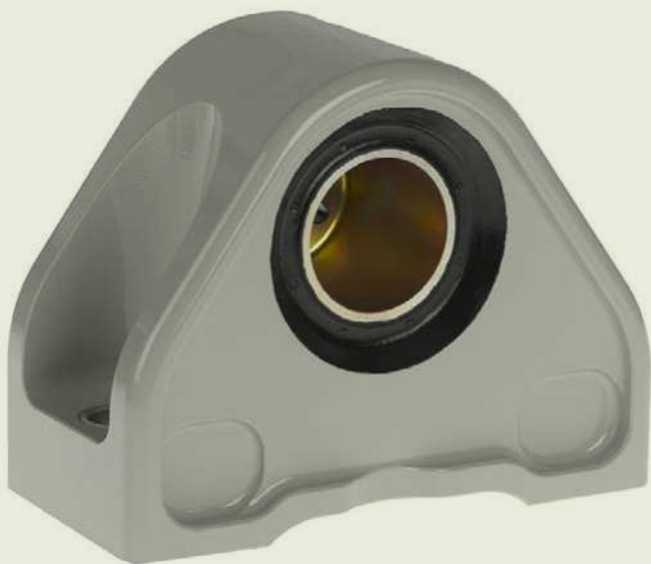


*Locking T-seal*



12

## Aerospace elastomeric and damping solutions



# 12 Aerospace elastomeric and damping solutions

|                            |            |
|----------------------------|------------|
| <b>Product range</b> ..... | <b>478</b> |
| Elastomeric bearings ..... | 478        |
| Isolators and mounts ..... | 479        |
| Dampers .....              | 479        |

Today, reduced direct operating costs (DOCs) and improved efficiencies and sustainability are driving new aircraft design. To achieve these goals, SKF supplies aerospace elastomeric solutions that:

- Carry heavy loads while absorbing, dampening and controlling large deflections occurring simultaneously in several directions
- Make aircraft lighter by reducing multi-component assemblies into single-units for compactness and minimal maintenance requirements
- Provide longer life and good performance in operation under severe environmental conditions including humidity and contamination (such as dust)

SKF has extensive experience in developing, engineering, testing and manufacturing elastomeric solutions. SKF's unmatched expertise is used to optimize elastomeric solutions by making them quieter, smoother, safer and more reliable. Through custom formulation, compounding, moulding and bonding of precision elastomeric products, SKF solves the most demanding application specific problems in aerospace.

For example, replacing traditional helicopter main rotor hubs with elastomeric bearings can result in:

- 75% reduction in the number of parts
- 20% reduction in weight
- 50% life increase
- 75% reduction in maintenance costs

## Product range

Aerospace elastomeric solutions are produced by layering elastomers between shims of substrates.

SKF supplies a wide range of materials including high quality elastomeric formulas and specific rubber compounds to meet your needs.

SKF supplies a wide range of elastomeric solutions, as presented below. They can be customized to meet the most demanding application requirements.

## Elastomeric bearings

Elastomeric bearings are of a laminated design built up from thin individual layers. They are used as flexible joints to accommodate multi-modulus deflections with minimized power loss and optimized stress-strain distribution. Some examples are given in **figure 1**.

Figure 1

Elastomeric bearings  
Product examples



# Isolators and mounts

Isolators and mounts are solutions with a targeted stiffness to accommodate vibration within a system or as a joint between components. They are made of materials with extensive resistance to environmental conditions including contamination and temperature. Some examples are given in **figure 2**.

## Dampers

Dampers use modulus adjustable materials to:

- Reduce the hysteresis effect
- Absorb shocks and energy

Typical applications include helicopter rotor lead lag dampers. Some examples are given in **figure 3**.

Figure 2

### Isolators and mounts

Product examples



Figure 3

### Dampers

Product examples





# D Index

|                  |     |
|------------------|-----|
| Text index.....  | 482 |
| Table index..... | 490 |

# Text index

## Symboler

Δdmp, see tolerances 45, 140, 149  
ΔDmp, see tolerances 45, 140, 149  
Δds, see tolerances 45, 140, 149  
ΔDs, see tolerances 45, 140, 149  
11AN..., see legacy products 151  
11AW..., see legacy products 151  
11BN.. 238  
11BN..., see cross-reference to legacy products 151  
11BW.. 151, 248, 249, 250, 251  
11BW..., see cross-reference to legacy products 151  
11C..E.. 216, 220  
11C..E..., see cross-reference to legacy products 151  
11C..N.. 214, 216  
11C..N..., see cross-reference to legacy products 151  
11C..W.. 216, 220  
11C..W..., see cross-reference to legacy products 151  
11E..H 224  
11E..H, see cross-reference to legacy products 151  
11F..E.. 216, 220  
11F..E..., see cross-reference to legacy products 151  
11F..N.. 214, 216  
11F..N..., see cross-reference to legacy products 151  
11F..W.. 216  
11F..W..., see cross-reference to legacy products 151  
11HN.. 238  
11HN..., see cross-reference to legacy products 151  
11HW.. 248  
11HW..., see cross-reference to legacy products 151  
11LBN.. 242  
11LBN..., see cross-reference to legacy products 151  
11LBW.. 252  
11LBW..., see cross-reference to legacy products 151  
11LHN.. 242  
11LHN..., see cross-reference to legacy products 151  
11LHW.. 252  
11LHW..., see cross-reference to legacy products 151  
12BF.. 358  
12BF..., see cross-reference to legacy products 295  
12BM.. 344  
12BM..., see cross-reference to legacy products 295  
12BNF.. 366  
12BNF..., see cross-reference to legacy products 295

12BNM.. 348  
12BNM..., see cross-reference to legacy products 295  
12CF.. 362  
12CF..., see cross-reference to legacy products 295  
12CM.. 346  
12CM..., see cross-reference to legacy products 295  
12CNF.. 368  
12CNF..., see cross-reference to legacy products 295  
12CNM.. 350  
12CNM..., see cross-reference to legacy products 295  
15-5PH  
    Customized products 141  
15CDV6, see material 46  
16NCD13 286  
16NCD13, see material 437  
17-4PH, see material 46, 139, 148, 289, 291, 395, 401, 460  
30NCD16, see material 289, 291  
32CDV13, see material 449  
32CrMoV13, see material 449  
40NCD7, see material 291  
80MoCrV42-16, see material 449  
100Cr6 (100C6), see material 46, 138, 286, 432, 437, 449, 460  
431, see material 46, 286, 401, 437  
440C, see material 46, 138, 139, 148, 286, 291, 432, 437, 449, 457, 460, 466  
2024, see material 395, 401, 431  
2618, see material 395, 401  
4340, see material 291  
9310, see material 449  
9315, see material 286, 437  
52100, see material 46, 138, 286, 437, 449, 460  
..SN, see legacy products 151  
..SW, see legacy products 151

## A

ABS0576  
    Spherical plain bearings 148  
ABS2171, see customer standards 403  
ABS2172, see customer standards 403  
ABS2173, see customer standards 403  
ABS2174, see customer standards 403  
Adjustable rod, see engineered composite solutions 441  
Aeroengine bearings 445  
AGS3808, see legacy standards 403  
AGS3809, see legacy standards 403  
AGS3810, see legacy standards 403  
AGS3811, see legacy standards 403  
Airframe solutions 15  
Alloy steel, see material 46, 47, 286, 289, 291, 431, 437  
Aluminium alloy, see customized products 150  
Aluminium alloy, see material 392, 401, 431  
AMS03-19, see surface treatments 139, 149, 290, 292, 401, 437  
AMS03-25, see surface treatments 401, 432  
AMS 2417, see surface treatments 46, 139, 149, 292, 432, 437  
AMS 2460, see surface treatments 139, 149  
AMS 2700, see surface treatments 46, 139, 149, 292, 437  
AMS 4533, see material 138, 139  
AMS 4535, see material 138, 139  
AMS 4640, see material 139  
AMS 4643, see material 139, 289, 291  
AMS 4928, see material 289, 291  
AMS 5618, see material 46, 138, 139, 432, 437, 449  
AMS 5628, see material 46, 286, 437  
AMS 5629  
    Customized products 141  
    Material 291  
AMS 5629, see material 148  
AMS 5630, see material 46, 138, 139, 148, 432, 437, 460  
AMS 5643 148  
AMS 5643, see material 46  
AMS 5659  
    Customized bearings 141  
AMS 5749, see products 449  
AMS 5925, see material 449  
AMS 6263, see material 286, 437  
AMS 6278, see material 449  
AMS 6415, see material 291  
AMS 6440, see material 46, 138, 432, 437  
AMS 6444, see material 46, 138, 432, 437, 449  
AMS 6481, see material 449  
AMS 6491, see material 449  
AMS 7310, see material 471  
AMS-QQ-A-200/3, see material 401  
AMS-QQ-A-225/6, see material 401  
AMS-QQ-P-146, see surface treatments 139  
AMS-QQ-P-416, see surface treatments 149, 286, 290, 292, 401  
AMS-S-5000, see material 291  
Angled head  
    Rod ends 293  
Angular contact ball bearing, see customized bearings for aeroengine solutions 445  
Angular contact bearing  
    Aerospace thin section bearings 458  
Anti-rotation features  
    Customized bearings for aeroengine solutions 448  
    Customized products for Airframe metal-to-metal spherical plain bearings 141  
    Customized products for Airframe rod ends 295  
    Customized products for Spherical plain bearings 150  
    Groove and keyway for Airframe rod ends 293



## Application

- Aerospace sealing solutions 471
- Aerospace specialty and engineered balls 464
- Aerospace thin section bearings 456
- Airframe solutions 15
- Customized bearings for aeroengine solutions 446
- Engineered composite solutions 440
- Engineered needle bearings 436
- Engineered pulleys 430
- Rod ends 282
- Rolling bearings 32
- Self-lubricating journal bearings 392
- Spherical plain bearings 128
- AP., see pulley 51
- AS 7034
  - Engineered pulleys 431
- AS 7034, see legacy products 432
- AS 14101 21, 143, 236, 238
- AS 14102 21, 143, 248
- AS 14103 21, 143, 248
- AS 14104 21, 143, 236, 238
- AS 15001
  - Rod ends 289
- AS 21151 24, 283, 332
- AS 21153 24, 283, 334
- AS 21154 19, 133, 186
- AS 21155 19, 133, 186
- AS 21230, see legacy standards 151
- AS 21231, see legacy standards 151
- AS 21232, see legacy standards 151
- AS 21233, see legacy standards 151
- AS 21428 17, 33, 92
- AS 21443, see pulley 51
- AS 27640 17, 33, 78
- AS 27641 17, 33, 80
- AS 27642 17, 33, 84
- AS 27643 17, 33, 114
- AS 27644 17, 33, 98
- AS 27645 17, 33, 106
- AS 27646 17, 33, 92, 94
- AS 27647 17, 33, 100
- AS 27648 17, 33, 102
- AS 81819
  - Spherical plain bearings 148
- AS 81820
  - Self-lubricating journal bearings 394
  - Spherical plain bearings 144, 148
- AS 81820/1 21, 143, 240, 242
- AS 81820/2 21, 143, 252
- AS 81820/3 21, 143, 252
- AS 81820/4 21, 143, 240, 242
- AS 81934
  - Self-lubricating journal bearings 394
  - Spherical plain bearings 148
- AS 81934/1 26, 393
- AS 81934/2 26, 393
- AS 81935
  - Rod ends 293
- AS 81935/1 24, 283, 344
- AS 81935/2 24, 283, 358
- AS 81935/4 24, 283, 348
- AS 81935/5 24, 283, 366
- AS 81935/6 24, 283, 346
- AS 81935/7 24, 283, 362
- AS 81935/8 24, 283, 350
- AS 81935/9 24, 283, 370
- AS 81936/1 19, 133, 206
- AS 81936/2 19, 133, 206
- AS 82819
  - Spherical plain bearings 148
- ASNA2121, see customer standards 151
- ASNA2122, see customer standards 151
- ASNA2123, see customer standards 151
- ASNA2124, see customer standards 151
- ASNA2127, see customer standards 403
- ASNA2128, see customer standards 403
- ASTM A-295, see material 460
- Axial internal clearance
  - Rolling bearings 47
  - Spherical plain bearings 136

## Axial load

- Aerospace thin section bearings 457
- Customized bearings for aeroengine solutions 447
- Rolling bearings 35
- Self-lubricating journal bearings 395
- Spherical plain bearings 134
- Axial load factor
  - Rolling bearings 38
- Axial location
  - Rolling bearings 42
- Axial projected area Aa
  - Spherical plain bearings 144
- Axial static limit load Ca
  - Rod ends 292
  - Rolling bearings 37
  - Self-lubricating journal bearing 395
  - Spherical plain bearings 134, 144
- Axial translation
  - Spherical plain bearings 128
- Axle
  - Rolling bearings 51
- Aerospace elastomeric and damping solutions 476

# B

- BACB28AB, see customer standards 403
- BACB28AV, see customer standards 403
- BACB28AY, see customer standards 403
- BACB28BF, see customer standards 403
- Ball grades
  - Aerospace specialty and engineered balls 467
- Ballpin
  - Spherical plain bearings 150
- Ball plugs, see aerospace specialty and engineered balls 465
- Ball(s)
  - Aerospace specialty and engineered balls 464
  - Aerospace thin section bearings 458
  - Rolling bearings 32
  - Terminology 32
- BAS7661, see legacy standards 403
- BAS7662, see legacy standards 403
- BAS7663, see legacy standards 403
- BAS7664, see legacy standards 403
- Basic radial static limit load Co
  - Rolling bearings 37
- BB series
  - Aerospace thin section bearings 461
- BCA1..M, see legacy products 403
- BCA1..., see legacy products 403
- BCA2..M, see legacy products 403
- BCA2..., see legacy products 403
- Bearing designs
  - Aerospace thin section bearings 457
  - Customized bearings for aeroengine solutions 447
  - Engineered composite solutions 440
  - Engineered needle bearings 436
  - Engineered pulleys 430
  - Rod ends 282
  - Rolling bearings 32
  - Self-lubricating journal bearings 392
  - Spherical plain bearings 132, 142
- Bearing functions
  - Aerospace thin section bearings 457
  - Customized bearings for aeroengine solutions 447
  - Engineered composite solutions 440
  - Engineered needle bearings 436
  - Engineered pulleys 430
  - Rod ends 282
  - Rolling bearings 32
  - Self-lubricating journal bearings 392
  - Spherical plain bearings 132, 142
- Bearing geometries
  - Aerospace thin section bearings 457
  - Bearing functions 436
  - Customized bearings for aeroengine solutions 447
  - Engineered composite solutions 440
  - Engineered pulleys 430
  - Rod ends 282
  - Rolling bearings 32
  - Self-lubricating journal bearings 392
  - Spherical plain bearings 132, 142
- Bearing life
  - Engineered needle bearings 436
  - Rolling bearings 39
  - Self-lubricating journal bearings 394
  - Spherical plain bearings 144
- Bearing-pulley body bond strength static load
  - Engineered pulleys 431
- Bearing series
  - Aerospace thin section bearings 457
  - Customized bearings for aeroengine solutions 447
  - Engineered composite solutions 440
  - Engineered needle bearings 436
  - Engineered pulleys 430
  - Rod ends 282
  - Rolling bearings 32
  - Self-lubricating journal bearings 392
  - Spherical plain bearings 132, 142
- Bearing steel, see material 46, 138, 432, 437
- Bearing types
  - Aerospace thin section bearings 457
  - Airframe introduction 28
  - Rolling bearings 35
  - Spherical plain bearings 129
- Bearing variants
  - Customized bearings for aeroengine solutions 447
  - Engineered composite solutions 440
  - Engineered needle bearings 436
  - Engineered pulleys 430
  - Rod ends 282
  - Rolling bearings 34
  - Self-lubricating journal bearings 392
  - Spherical plain bearings 132, 142
- BFA1..., see legacy products 403
- BFA2..., see legacy products 403
- BFA-A-, see legacy products 403
- BFA-C-, see legacy products 403
- BG42, see material 449
- BLA1..M, see legacy products 403
- BLA1..., see legacy products 403
- BLA2..M, see legacy products 403
- BLA2..., see legacy products 403
- Body, see shell 392
- Bolted plate
  - Spherical plain bearings 155
- Bolt holes
  - Self-lubricating journal bearings 403
- Boots, see aerospace sealing solutions 469
- Bore diameter d
  - Self-lubricating journal bearings 395
- Bore motion, see dynamic loading condition 135
- BPA1..., see legacy products 403
- BPA2..., see legacy products 403
- BPA-A-, see legacy products 403
- BPA-C-, see legacy products 403
- Brass, see material 449, 461
- Bronze aluminium, see material 139
- Bronze beryllium, see material 138
- Bronze, see material 129, 131
- Bronze/steel, see sliding contact surface combination 131, 135
- Bump stops
  - Rod ends 295
  - Spherical plain bearings 141, 150

# C

- C-13MoCrNiV40, see material 449
- C25
  - Spherical plain bearings 145
- Cable
  - Engineered pulleys 430
- Cadmium, see surface treatments 46, 139, 149, 286, 290, 292, 396, 401, 432, 437, 441
- Cage
  - Aerospace thin section bearings 459
  - Customized bearings for aeroengine solutions 447
  - Engineered pulleys 430
  - Rolling bearings 51
- Carbon fibre
  - Customized bearings for aeroengine solutions 450
  - Engineered composite solutions 440
- Carbon seals, see aerospace sealing solutions 469
- Carbon, see material 470
- Carburized, see material 449
- Case hardening alloy steel, see material 286, 437
- Case hardening corrosion-resistant steel, see material 286, 437
- Case hardening steel
  - Engineered needle bearings 437
  - Rolling bearings 51
- Cassette seals, see aerospace sealing solutions 469
- CDA..R, see legacy products 403
- CDA..., see legacy products 403
- Ceramic
  - Aerospace specialty and engineered balls 466
  - Aerospace thin section bearings 457
  - Customized bearings for aeroengine solutions 449
  - Rolling bearings 51
- Chemical conversion
  - Self-lubricating journal bearings 403
- Chemical passivation
  - Engineered needle bearings 437
  - Rod ends 292
  - Rolling bearings 51
  - Self-lubricating journal bearings 401
  - Spherical plain bearings 149
- Chemical passivation, see surface treatments 139
- Chromate, see surface treatments 46, 432
- Chromex40, see material 449
- Chromic acid anodizing
  - Self-lubricating journal bearings 403
- Chromium 6, see surface treatments 46, 51, 139, 141, 149, 150, 286, 290, 292, 401, 403, 432
- Chromium, see surface treatments 139, 149, 151, 396, 403, 461
- Circlip groove
  - Self-lubricating journal bearings 403
- Coating
  - Aerospace thin section bearings 461
  - Spherical plain bearings 148
- Cobalt alloys
  - Spherical plain bearings 141
- Combined loads
  - Rolling bearings 38
  - Spherical plain bearings 134
- Compactness
  - Aerospace thin section bearings 460
  - Customized bearings for aeroengine solutions 446
  - Engineered pulleys 430
  - Rolling bearings 36
- Composite 439
- Conduction braid
  - Engineered composite solutions 440
- Contacts II
- Contaminants
  - Aerospace elastomeric and damping solutions 478
  - Aerospace thin section bearings 460
  - Customized bearings for aeroengine solutions 449
  - Rolling bearings 40
  - Spherical plain bearing 140, 149
  - Spherical plain bearings 131, 145
- Controlled clearance, see bearing functions 142, 147, 152
- Corrosion resistance
  - Rod ends 286
  - Spherical plain bearings 131
- Corrosion resistance, see material 46, 148, 286, 290
- Corrosion resistance, see surface treatments 46, 139, 149
- Corrosion-resistant high nitrogen steel (CREN)
  - Rolling bearings 51
- Corrosion-resistant steel, see material 46, 138, 139, 148, 286, 289, 290
- Counterbore
  - Spherical plain bearings 141, 150
- Counterface
  - Self-lubricating journal bearing 396
- CRS, see material 401
- Crimping ring
  - Engineered pulleys 431
- Cross-reference
  - Rod ends 382
  - Rolling bearings 118
  - Self-lubricating journal bearings 426
  - Spherical plain bearings 268
- Cross-reference to legacy products
  - Rod ends 295
  - Spherical plain bearings 151
- CuAl10Ni5Fe4, see material 139
- CuBe 1.9, see material 138, 139
- Customer standards
  - Self-lubricating journal bearings 403
  - Spherical plain bearings 151
- Customized products
  - Rod ends 295
  - Rolling bearings 51
  - Self-lubricating journal bearings 403
  - Spherical plain bearings 141, 150
- Cylindrical roller bearing, see customized bearings for aeroengine solutions 445
- Cobalt alloys
  - Aerospace specialty and engineered balls 466

# D

- DEF STAN 03-19, see surface treatments 139, 149, 290, 292, 401, 437
- DEF STAN 03-25, see surface treatments 401, 432
- Design features
  - Aerospace thin section bearings 457
  - Customized bearings for aeroengine solutions 448
  - Rod ends 284
  - Spherical plain bearings 130
- Deviation of a single bore diameter, see tolerances 45, 140, 149
- Deviation of a single outside diameter, see tolerances 45, 140, 149
- Diagonal internal clearance
  - Rolling bearings 47
- Diaphragm seals, see aerospace sealing solutions 469
- Dismounting
  - Rod ends 294
  - Rolling bearings 50
  - Self-lubricating journal bearings 402
  - Spherical plain bearings 155
- Dismounting grooves
  - Customized bearings for aeroengine solutions 448
- DJA..R, see legacy products 403
- DJA..., see legacy products 403
- Double ended links
  - Rod ends 295
- Double fork end
  - Engineered composite solutions 441
- Double journal bearings
  - Self-lubricating journal bearings 403
- Double row bearing, see customized bearings for aeroengine solutions 447
- Double row bearing, see engineered needle bearings 436
- Double row bearing, see engineered pulleys 430
- Double row bearing, see rod ends 285
- Double row bearing, see rolling bearings 31
- Download II
- Dry film lubrication
  - Self-lubricating journal bearings 403
- Dry lubricants
  - Spherical plain bearings 139
- DTD 5014 TF, see material 395, 401
- Dynamic load
  - Engineered pulleys 431
  - Rod ends 292
  - Rolling bearings 38
  - Spherical plain bearings 135, 144
- Dynamic load for rod ends with inserted bearings
  - Rod ends 292
- Dynamic loading condition
  - Spherical plain bearings 135
- Dynamic load rating
  - Rolling bearings 38
  - Self-lubricating journal bearings 394
  - Spherical plain bearings 135, 144
- Dynamic operating load P
  - Rolling bearings 39
- Dynamic radial load
  - Engineered needle bearings 436
- Dynamic rotational torque, see rotational frictional moment 146
- Dynamic wear limit
  - Self-lubricating journal bearings 394
  - Spherical plain bearings 144

# E

3490, see material 46  
 EASA Part 145, see remanufacturing 450  
 ECOPUR, see material 470  
 Elastomeric bearings, see elastomeric and damping solutions 477  
 Elastomeric solutions 477  
 EN 2009, see legacy standards 51  
 EN 2010, see legacy standards 51  
 EN 2011, see legacy standards 51  
 EN 2012, see legacy standards 51  
 EN 2013, see legacy standards 51  
 EN 2014, see legacy standards 51  
 EN 2015, see legacy standards 51  
 EN 2016, see legacy standards 51  
 EN 2017, see legacy standards 51  
 EN 2018, see legacy standards 51  
 EN 2019, see legacy standards 51  
 EN 2020, see legacy standards 51  
 EN 2030, see material 46, 138, 139, 148, 432, 437  
 EN 2031, see material 46, 138, 432, 437  
 EN 2062  
   Engineered pulleys 431  
   EN 2062, see legacy products 432  
   EN 2081, see legacy products 432  
   EN 2099, see material 286, 437  
   EN 2137, see material 289, 291  
   EN 2249, see material 46  
   EN 2285 26, 393, 404  
   EN 2286 26, 393, 408  
   EN 2287 26, 393, 404  
   EN 2288 26, 393, 408  
   EN 2318, see material 401  
   EN 2335 19, 133, 168  
   EN 2336 19, 133, 156  
   EN 2475, see material 289, 291  
   EN 2498 23, 283, 312  
   EN 2539, see material 46, 139, 148, 289, 291  
   EN 2584 20, 143, 216  
   EN 2585 20, 143, 220  
   EN 2588 19, 133, 156  
   EN 2701, see material 401  
   EN 2704, see material 401  
   EN 2755  
     Self-lubricating journal bearings 394  
     Spherical plain bearings 144  
 EN 3045 17, 33, 54  
 EN 3046 17, 33, 54  
 EN 3047 17, 33, 54  
 EN 3048 20, 143, 214  
 EN 3053 17, 33, 72  
 EN 3054 17, 33, 72  
 EN 3055 17, 33, 72  
 EN 3056 17, 33, 62  
 EN 3057 17, 33, 62  
 EN 3058 17, 33, 62  
 EN 3059 17, 33, 64  
 EN 3060 17, 33, 64  
 EN 3061 17, 33, 64  
 EN 3182, see pulley 51  
 EN 3281 17, 33, 58  
 EN 3282 17, 33, 58  
 EN 3283 17, 33, 58  
 EN 3284 17, 33, 54  
 EN 3285 17, 33, 54  
 EN 3286 17, 33, 54  
 EN 3287 17, 33, 68  
 EN 3288 17, 33, 68  
 EN 3289 17, 33, 68  
 EN 3290 17, 33, 74  
 EN 3291 17, 33, 74  
 EN 3292 17, 33, 74  
 EN 3311, see material 289, 291  
 EN 3490, see material 46, 286, 401, 437  
 EN 3541 23, 283, 296  
 EN 3629, see pulley 51  
 EN 4033 17, 33, 58  
 EN 4034 17, 33, 70  
 EN 4036 23, 283, 296  
 EN 4037 20, 143, 214  
 EN 4038 20, 143, 216  
 EN 4039 20, 143, 220  
 EN 4040 20, 143, 224  
 EN 4041 17, 33, 66  
 EN 4156 24, 283, 326  
 EN 4157 24, 283, 326  
 EN 4198 23, 283, 312  
 EN 4265 19, 133, 198  
 EN 4266 19, 133, 198  
 EN 4351, see legacy standards 295  
 EN 4534-2 26, 393  
 EN 4535-2 26, 393  
 EN 4536-2 26, 393  
 EN 4537-2 26, 393  
 EN 6046 19, 133, 190, 192  
 End of life criteria  
   Spherical plain bearings 135  
 Endurakote, see coatings 461  
 Endurance  
   Rod ends 292  
   Spherical plain bearings 144  
 Endurance dynamic load CE  
   Engineered pulleys 431  
 Endurance, see dynamic loading condition 135, 144, 292  
 Endura-Slim  
   Aerospace thin section bearings 457  
 Equivalent radial static load Ps  
   Rolling bearings 38  
 External thread  
   Rod end body features 293  
   Rod ends 282  
   Terminology 282

# F

Fatigue  
   Rod ends 292  
   Spherical plain bearings 135, 144  
 Fatigue load carrying capability Pmax  
   Rod ends 292  
 Fatigue, see dynamic loading condition 135, 144, 292  
 Fatigue, see material 401  
 Features  
   Rod ends 293  
 Female thread, see internal thread 282  
 Fiberslip 404, 412, 418  
   Liner 150, 392  
   Self-lubricating journal bearings 403  
   Spherical plain bearings 150  
 Fit  
   Engineered needle bearings 437  
   Rolling bearings 42  
   Self-lubricating journal bearings 396  
   Spherical plain bearings 152  
 Flange  
   Customized bearings for aeroengine solutions 448  
   Rolling bearings 32  
   Spherical plain bearings 141, 150  
   Terminology 32  
 Flanged bearing  
   Rolling bearings 44  
 Flanged bearing, see self-lubricating journal bearings 391  
 Flange diameter A  
   Self-lubricating journal bearings 395  
 Flanged units  
   Rolling bearings 44  
 Flange width F  
   Self-lubricating journal bearings 395  
 Flatted balls, see aerospace specialty and engineered balls 463  
 Fluid handling seals, see aerospace sealing solutions 469  
 Fork end  
   Engineered composite solutions 440  
 Four-point contact bearing  
   Aerospace thin section bearings 458  
 Fretting resistance, see fit 402  
 Fretting resistance, see surface treatments 46, 131, 139, 149, 286, 401, 432, 437  
 Friction coefficient  $\mu$   
   Spherical plain bearings 146  
 Full complement 32  
 Fiberslip 408

# G

G353, see lubrication 136  
 G354, see lubrication 39, 136, 285, 288, 432, 437  
 G395, see lubrication 39, 136, 285, 288, 432, 437  
 Gap, see split inner ring 132  
 Glass fibre  
   Customized bearings for aeroengine solutions 450  
   Engineered composite solutions 440  
   Engineered pulleys 431  
   Rolling bearings 47  
 Glass, see material 466  
 Graphite lubricants, see dry lubricants 139  
 Greased-for-life  
   Rod ends 288  
   Rolling bearings 28  
   Spherical plain bearings 137  
 Grease fitting  
   Rod ends 282  
   Terminology 282  
 Grease input, see lubrication grooves 137, 289  
 Grease, see lubrication 39, 137, 285, 288, 431, 437  
 Groove  
   Engineered pulleys 430  
 Groove flange strength static load CB  
   Engineered pulleys 431  
 Guide rings, see aerospace sealing solutions 469

# H

Hard anodizing  
   Self-lubricating journal bearings 403  
 Hard chromium plating  
   Self-lubricating journal bearings 403  
 Hard chromium, see coatings 461  
 Hard chromium, see surface treatments 139, 149, 396  
 Hardness, see material 46, 138, 139, 148, 286, 289, 291, 396, 432, 460, 466  
 Head shape  
   Rod ends 293  
 High frequency motion  
   Rod ends 282  
 High frequency oscillation  
   Spherical plain bearings 131  
 High load, see bearing functions 132  
 High misalignment, see bearing functions 21, 132, 143  
 High speed  
   Customized bearings for aeroengine solutions 446

High temperature  
 Aerospace carbon seals for turbine engines 471  
 Aerospace elastomeric and damping solutions 479  
 Aerospace thin section bearings 460  
 Customized bearings for aeroengine solutions 449  
 Customized products 51, 141  
 Rolling bearings 51  
 Sealing rings 471  
 Spherical plain bearings 141  
 Hollow balls, see aerospace specialty and engineered balls 463  
 Horizontal groove, see locating groove 282  
 Hybrid bearings  
 Aerospace thin section bearings 460  
 Hydraulic seals, see aerospace sealing solutions 469

**I**  
 Increased internal clearance  
 Engineered pulleys 431  
 Rolling bearings 48  
 Inner ring  
 Aerospace thin section bearings 458  
 Rolling bearings 32  
 Spherical plain bearings 128  
 Terminology 32, 128  
 Inner ring side run-out with raceway, see tolerances 45  
 Insert  
 Engineered composite solutions 441  
 Inserted spherical plain bearing  
 Rod ends 282  
 Terminology 282  
 Integrated axle  
 Engineered needle bearings 436  
 Rolling bearings 51  
 Integrated metal-to-metal spherical plain bearing  
 Rod ends 282  
 Terminology 282  
 Integrated rolling bearing  
 Rod ends 282  
 Terminology 282  
 Interfaces  
 Rolling bearings 42  
 Spherical plain bearings 152  
 Internal clearance  
 Aerospace thin section bearings 457  
 Engineered pulleys 431  
 Rod ends 289  
 Rolling bearings 47  
 Spherical plain bearings 136, 147  
 Internal thread  
 Rod ends 282  
 Terminology 282  
 ISO 8075, see surface treatments 46, 139, 149  
 Isolators, see elastomeric and damping solutions 477

**J**  
 JN..C, see pulley 51  
 Jointing compound  
 Spherical plain bearings 153  
 Journal bearings, see self-lubricating journal bearings 25

**K**  
 Kea, see tolerances 45  
 Keyway  
 Rod ends 282  
 Terminology 282  
 Kia, see tolerances 45  
 KT series  
 Aerospace thin section bearings 461

**L**  
 L10 life  
 Rolling bearings 39  
 L50 life  
 Rolling bearings 38  
 Left-hand thread  
 Rod ends 293  
 Legacy products  
 Engineered pulleys 432  
 How to use the catalogue 13  
 Rod ends 295  
 Self-lubricating journal bearings 403  
 Spherical plain bearings 151  
 Legacy standards  
 How to use the catalogue 13  
 Rod ends 295  
 Rolling bearings 51  
 Spherical plain bearings 151  
 Length to back face of flange L  
 Self-lubricating journal bearings 395  
 Light, see bearing geometries 132, 142  
 Lightweight  
 Aerospace elastomeric and damping solutions 478  
 Aerospace specialty and engineered balls 466  
 Aerospace thin section bearings 461  
 Customized bearings for aeroengine solutions 449  
 Engineered composite solutions 440  
 Rod ends 289, 291  
 Self-lubricating journal bearings 392, 401  
 Spherical plain bearings 141, 150  
 Limit of usable liner thickness, see end of life criteria 145  
 Lined bore  
 Rod ends 292  
 Self-lubricating journal bearings 392  
 Spherical plain bearings 150  
 Liner  
 Self-lubricating journal bearings 392, 401  
 Spherical plain bearings 128  
 Terminology 128, 392  
 Liner in bore  
 Spherical plain bearings 141  
 Liquid nitrogen, see material 466  
 Liquid nitrogen, see mounting 153, 402  
 Liquid nitrogen, see operating temperature 147, 394  
 Load carrying capability  
 Customized bearings for aeroengine solutions 447  
 Engineered composite solutions 440  
 Engineered needle bearings 436  
 Engineered pulleys 431  
 Rod ends 292  
 Rolling bearings 37  
 Self-lubricating journal bearings 394  
 Spherical plain bearings 134, 144

Loaded frictional moment T  
 Spherical plain bearings 146  
 Loader slot  
 Spherical plain bearings 132  
 Load-life relationship  
 Rolling bearings 39  
 Locating groove  
 Rod ends 282  
 Terminology 282  
 Locating locking hole  
 Rod ends 293  
 Locking device  
 Engineered composite solutions 441  
 Locking T-seals, see aerospace sealing solutions 469  
 Lubrication  
 Engineered needle bearings 437  
 Engineered pulleys 431  
 Rod ends 285, 288  
 Rolling bearings 39  
 Self-lubricating journal bearings 402  
 Spherical plain bearings 137  
 Lubrication grooves  
 Customized bearings for aeroengine solutions 448  
 Rod ends 289  
 Rolling bearings 51  
 Spherical plain bearings 128, 137, 141  
 Terminology 128

**M**  
 M50  
 Aerospace specialty and engineered balls 466  
 Aerospace thin section bearings 461  
 Rolling bearings 51  
 M50-NiL, see material 449, 466  
 M50, see material 449, 461, 466  
 Maintenance-free  
 Self-lubricating journal bearings 28, 392  
 Spherical plain bearings 28, 130  
 Male thread, see external thread 282  
 Manufacturing capabilities 10  
 Master ball sets, see aerospace specialty and engineered balls 463  
 Material  
 Aerospace sealing solutions 470  
 Aerospace specialty and engineered balls 466  
 Aerospace thin section bearings 460  
 Customized bearings for aeroengine solutions 449  
 Engineered needle bearings 437  
 Engineered pulleys 431  
 Rod ends 286, 289, 291  
 Rolling bearings 45  
 Self-lubricating journal bearings 401  
 Spherical plain bearings 138, 148  
 Maximum allowable internal clearance limit, see end of life criteria 135, 145  
 Metal, see material 470  
 Metal-to-metal, see spherical plain bearings  
 Rolling bearings 127  
 Metal-to-metal spherical plain bearing rod end, see rod ends 281  
 MIL-A-8625, see surface treatments 290, 401, 432  
 MIL-DTL-7034/1, see legacy products 432



MIL-DTL-7034/2, see legacy products 432  
 MIL-DTL-7034/3, see legacy products 432  
 MIL G 21164, see lubrication 136  
 MIL PRF 23827, see lubrication 39, 136, 285, 288, 432, 437  
 MIL PRF 81322, see lubrication 39, 136, 285, 288, 432, 437  
 Misalignment  
   Customized bearings for aeroengine solutions 447  
   Rolling bearings 36  
   Spherical plain bearings 128  
 Moment load  
   Aerospace thin section bearings 457  
   Customized bearings for aeroengine solutions 447  
 MoS<sub>2</sub>, see dry lubricants 139  
 Mounting  
   Engineered needle bearings 437  
   Rod ends 294  
   Rolling bearings 49  
   Self-lubricating journal bearings 402  
   Spherical plain bearings 153  
 Mounts, see elastomeric and damping solutions 477  
 M series  
   Aerospace thin section bearings 460

## N

Narrow, see bearing geometries 132, 142  
 Needle bearings 435  
 Needle roller bearing, see needle bearings 435  
 Needle track roller bearing, see needle bearings 435  
 Nickel alloys  
   Aerospace specialty and engineered balls 466  
   Spherical plain bearings 141  
 Nitrided, see material 449, 466  
 Nitriding  
   Rolling bearings 51  
 Nitriding, see surface treatments 437  
 Nitrile rubber, see material 461  
 Non-metallic materials, see material 47, 431, 461, 466, 471  
 Notches  
   Spherical plain bearings 141, 150  
 NSA 8134 21, 143, 232  
 NSA 8134, see customer standards 151  
 NSA 8135 21, 143, 244  
 NSA 8135, see customer standards 151  
 NSA 8136 21, 143, 232  
 NSA 8136, see customer standards 151  
 NSA 8137 21, 143, 244  
 NSA 8137, see customer standards 151  
 NSA 8143 24, 283, 352  
 NSA 8145 26, 393  
 NSA 8146 26, 393  
 NSA 8147 26, 393  
 NSA 8148 26, 393  
 NSA 8149 24, 283, 374  
 NSA 8194, see customer standards 403  
 NSA 8195, see customer standards 403  
 Nut and washer design  
   Rolling bearings 51  
   Spherical plain bearings 141, 150  
 Nylon, see material 466

## O

Oil  
   Customized bearings for aeroengine solutions 447  
 Open bearings  
   Aerospace thin section bearings 457  
 Operating clearance  
   Rolling bearings 48  
   Spherical plain bearings 152  
 Operating temperature  
   Aerospace sealing solutions 470  
   Aerospace thin section bearings 460  
   Customized bearings for aeroengine solutions 449  
   Engineered needle bearings 437  
   Engineered pulleys 431  
   Rod ends 285, 289, 291  
   Rolling bearings 40  
   Self-lubricating journal bearings 394  
   Spherical plain bearings 138, 147  
 Outer diameter D  
   Self-lubricating journal bearings 395  
 Outer race, see outer ring 32, 128, 458  
 Outer ring  
   Aerospace thin section bearings 458  
   Rolling bearings 32  
   Spherical plain bearings 128  
   Terminology 32, 128  
 Outer ring side run-out with raceway, see tolerances 45  
 Oversize  
   Rolling bearings 49  
   Self-lubricating journal bearings 402  
   Spherical plain bearings 155  
 Overall width W  
   Self-lubricating journal bearings 395

## P

Paint  
   Engineered composite solutions 440  
   Rod ends 293  
 PAN4832, see legacy standards 403  
 PAN4833, see legacy standards 403  
 PAN4834, see legacy standards 403  
 PAN4835, see legacy standards 403  
 PA., see legacy products 432  
 PD..K, see pulley 51  
 PEEK, see polyether ether ketone 450  
 PEEK, see Polyether ether ketone 461, 470, 475  
 Permanent set  
   Self-lubricating journal bearings 394  
   Spherical plain bearings 144  
 PH13.8  
   Customized products 141  
   see material 141  
 PH13.8, see material 291  
 Phenolic laminate, see material 461  
 PHUFJ/XRE., see cross-reference to legacy products 295  
 PHUFJ/XRL., see cross-reference to legacy products 295  
 PHUMJ/XRE., see cross-reference to legacy products 295  
 PHUMJ/XRL., see cross-reference to legacy products 295  
 Pin  
   Spherical plain bearings 141, 150  
 Piston seals, see aerospace sealing solutions 469  
 P.K, see pulley 51  
 Plain bearing, see self-lubricating journal bearings 391  
 Plastic, see material 470  
 P..MSP, see legacy products 432  
 PNA., see legacy products 432  
 PN., see legacy products 432  
 PNU 219, see legacy products 432  
 PNU 220, see legacy products 432  
 PNU 221, see legacy products 432  
 Pockets  
   Spherical plain bearings 141, 150  
 Polyether ether ketone, see material 450, 461, 470, 475  
 Polyurethane, see material 470  
 Precision  
   Aerospace specialty and engineered balls 463  
   Aerospace thin section bearings 456, 457  
   Customized bearings for aeroengine solutions 446  
   Engineered composite solutions 441  
   Rolling bearings 48  
 Precision bearings  
   Aerospace thin section bearings 456  
   Customized bearings for aeroengine solutions 446  
   Rolling bearings 48  
 Precision specialty balls  
   Aerospace specialty and engineered balls 463  
   Customized bearings for aeroengine solutions 448  
   Rolling bearings 45  
 Pre-loading  
   Customized bearings for aeroengine solutions 447  
 Pre-staked design  
   Spherical plain bearings 141  
   Terminology 130  
 Product range  
   Aerospace sealing solutions 470  
   Elastomeric and damping solutions 478  
   Rod ends 282  
   Rolling bearings 32  
   Self-lubricating journal bearings 392  
   Spherical plain bearings 132, 142  
 P., see legacy products 432  
 P series  
   Aerospace thin section bearings 460  
 P..SP, see legacy products 432  
 PTFE fibres, see liner 148, 401  
 PTFE, see liner 130, 142, 401  
 PTFE, see material 47, 457, 470  
 Pulley 430  
   Rolling bearings 51  
 Pulley body  
   Engineered pulleys 430  
 Pushout load  
   Spherical plain bearings 154  
 PVD  
   Rolling bearings 51  
   Spherical plain bearings 141, 150

## Q

Quality management 10

## R

Radial contact bearing  
Aerospace thin section bearings 458  
Radial dynamic load rating C  
Self-lubricating journal bearings 395  
Radial internal clearance  
Rolling bearings 47  
Spherical plain bearings 136, 147  
Radial load  
Aerospace thin section bearings 457  
Customized bearings for aeroengine solutions 447  
Rolling bearings 37  
Spherical plain bearings 134, 144  
Radial projected area Ar  
Spherical plain bearings 144  
Radial run-out of assembled bearing inner ring, see tolerances 45  
Radial run-out of assembled bearing outer ring, see tolerances 45  
Radial shaft seals, see aerospace sealing solutions 469  
Radial static limit load Cs  
Rod ends 292  
Rolling bearings 37  
Self-lubricating journal bearings 395  
Spherical plain bearings 144  
Radial ultimate load  
Rod ends 292  
Rolling bearings 37  
Spherical plain bearings 135, 144  
Reduced clearance  
Rolling bearings 48  
Spherical plain bearings 136  
Reduced torque  
Spherical plain bearings 147  
Reliability factor K  
Rolling bearings 39  
Relubricated  
Rod ends 288  
Spherical plain bearings 28  
Relubrication  
Engineered needle bearings 437  
Rod ends 289  
Rolling bearings 51  
Spherical plain bearings 28, 137  
Remanufacturing  
Aerospace thin section bearings 461  
Customized bearings for aeroengine solutions 450  
Resin, see liner 148  
Retainer  
Rolling bearings 32  
Terminology 32  
Retaining compound  
Self-lubricating journal bearings 402  
Spherical plain bearings 153  
Retention  
Spherical plain bearings 154  
Retention feature  
Self-lubricating journal bearings 403  
Right-hand thread  
Rod ends 293  
RL..SP., see cross-reference to legacy products 151  
Rod and buffer seals, see aerospace sealing solutions 469  
Rod end bearings 22

Rod end body  
Rod ends 282  
Terminology 282  
Rod end body load carrying capability  
Rod ends 292  
Roller(s)  
Rolling bearings 32  
Terminology 32  
Rolling bearing rod end, see rod ends 281  
Rolling bearings 16  
Rotary manifold seals, see aerospace sealing solutions 469  
Rotating equipment performance 8  
Rotation  
Spherical plain bearings 128  
Rotational frictional moment  
Rolling bearings 41  
Spherical plain bearings 146  
Round head  
Rod ends 293  
Rubber, see material 470

## S

S97, see material 289, 291  
Seal  
Spherical plain bearings 128  
Terminology 128  
Sealing rings, see aerospace sealing solutions 469  
Sealing solutions 469  
Rod ends 286, 290, 292  
Rolling bearings 47  
Spherical plain bearing 140, 149  
Seals  
Aerospace thin section bearings 460  
Engineered pulleys 432  
Rod ends 286, 290, 292  
Rolling bearings 32, 40  
Spherical plain bearings 140, 149  
Terminology 32  
Sea, see tolerances 45  
Seizing resistance  
Spherical plain bearings 131  
Selection criteria  
Rod ends 284  
Rolling bearings 35  
Spherical plain bearings 129, 131  
Selection process 28  
Engineered needle bearings 436  
Engineered pulleys 430  
Rolling bearings 36  
Self-lubricating journal bearings 394  
Spherical plain bearings 134, 142  
Self-aligning ball bearing, see rolling bearings 31  
Self-lubricating, see spherical plain bearings 127  
Self-lubricating spherical plain bearing rod end, see rod ends 281  
Shackle  
Spherical plain bearings 141  
Shank  
Rod ends 282  
Terminology 282  
Shell  
Self-lubricating journal bearings 392  
Terminology 392  
Shields  
Aerospace thin section bearings 460  
Engineered pulleys 432  
Rod ends 286, 290, 292  
Rolling bearings 32, 40  
Spherical plain bearings 128, 140, 149  
Terminology 32, 128  
Sia, see tolerances 45  
Silicon nitride, see material 466  
Silicon, see material 461  
Silver plating  
Rolling bearings 51  
Self-lubricating journal bearing 403  
Spherical plain bearings 141, 150  
Silver plating, see material 449  
Single plane mean bore diameter deviation, see tolerances 45, 140, 149  
Single plane mean outside diameter deviation, see tolerances 45, 149  
Single row bearing, see rolling bearings 31  
Size  
Aerospace thin section bearings 456  
Customized bearings for aeroengine solutions 448  
Rod ends 285, 287, 291  
Rolling bearings 36  
Self-lubricating journal bearings 394  
Spherical plain bearings 134, 142  
SKF Black design composite fitting 439  
SKF care 9  
SKF Real-i-Slim 456  
Aerospace thin section bearings 456  
SKF Real-i-Slim TT series  
Aerospace thin section bearings 461  
SKF rolling bearings (industrial bearings) 10  
SKF slewing ring bearings 10  
SKF Spectraseal, see aerospace sealing solutions 469  
SKF Speedi-Sleeve Gold, see aerospace sealing solutions 469  
SKF Speedi-Sleeve, see aerospace sealing solutions 469  
SKF super precision bearings 10  
Sleeve  
Spherical plain bearings 141  
Sliding contact surface combination  
Spherical plain bearings 129, 135  
Slots, see loader slot 132  
Specialty balls 463  
Customized bearings for aeroengine solutions 447  
Speed factor  
Customized bearings for aeroengine solutions 447  
Spherical plain bearings 18, 126  
Spherical roller bearing, see customized bearings for aeroengine solutions 445  
Spherical roller bearing, see rolling bearings 31  
Split inner ring  
Spherical plain bearings 132  
Stainless steel, see material 46, 138, 139, 148, 291, 432, 437, 457, 460, 473  
Staked lip  
Self-lubricating journal bearings 403  
Spherical plain bearings 141  
Staking  
Rod ends 289, 291  
Rolling bearings 42  
Spherical plain bearings 154  
Staking groove  
Rolling bearings 51  
Spherical plain bearings 128  
Terminology 128  
Standard clearance  
Spherical plain bearings 136  
Starting torque  
Rolling bearings 41  
Spherical plain bearings 146  
Static axial limit load Ca  
Spherical plain bearings 144  
Static limit load  
Rod ends 292  
Rolling bearings 37  
Self-lubricating journal bearings 394, 395  
Spherical plain bearings 134, 144

- Static load
  - Rod ends 292
  - Rolling bearings 37
  - Self-lubricating journal bearings 395
  - Spherical plain bearings 134
- Static radial limit load Cs
  - Rolling bearings 37
  - Self-lubricating journal bearings 395
  - Spherical plain bearings 134, 144
- Static radial load CR
  - Engineered needle bearings 436
  - Engineered pulleys 431
- Static ultimate load
  - Rod ends 292
  - Rolling bearings 37
- Steel/bronze, see sliding contact surface combination 135
- Steel/steel, see sliding contact surface combination 135
- Stiffness
  - Aerospace elastomeric and damping solutions 479
  - Aerospace specialty and engineered balls 466
  - Aerospace thin section bearings 458
  - Customized bearings for aeroengine solutions 447
  - Engineered composite solutions 440
  - Spherical plain bearings 136, 146
- Storage
  - Customized bearings for aeroengine solutions 450
  - Rod ends 294
  - Rolling bearings 50
  - Self-lubricating journal bearings 402
  - Spherical plain bearings 155
- Stress ratio R
  - Rod ends 292
- Structural fibres, see liner 148, 401
- Structural rod, see engineered composite solutions 439
- Sulfuric acid anodizing, see surface treatments 401, 432
- Surface treatments
  - Engineered needle bearings 437
  - Engineered pulleys 432
  - Rod ends 286, 290, 292
  - Rolling bearings 46
  - Self-lubricating journal bearings 401
  - Spherical plain bearings 139, 149
- Swaged
  - Spherical plain bearings 132, 142
- Swivelling
  - Rolling bearings 32
  - Spherical plain bearings 128, 146
- Swivelling frictional moment 28
- Self-lubricating journal bearings 390
- Single plane mean outside diameter deviation, see tolerances 140
- Relubricated 137
- Stainless steel, see material 449
- Static ultimate load
  - Spherical plain bearings 135
- Swivelling frictional moment
  - Rolling bearings 41

## T

- TA6V, see material 289, 291
- Tapered roller bearing, see aerospace thin section bearings 461
- Tapered roller bearings, see customized bearings for aeroengine solutions 445
- Tartaric sulfuric anodizing
  - Self-lubricating journal bearings 403

- Tear drop head
  - Rod ends 293
- Tensile strength (Rm), see material 286, 289, 291
- Textilub
  - Self-lubricating journal bearings 403
  - Spherical plain bearings 150
- Thermal expansion
  - Customized bearings for aeroengine solutions 448
  - Engineered composite solutions 440
  - Rolling bearings 42
  - Spherical plain bearings 136, 147
- Thermoplastic elastomers, see material 470
- Thin section bearings 455
- Threaded plate
  - Spherical plain bearings 155
- Thread type
  - Rod ends 293
- Three and four-point contact ball bearings, see customized bearings for aeroengine solutions 445
- Through hardened, see material 449, 466
- Thrust washer, see liner 392
- Ti6Al4V, see material 289, 291
- Titanium alloy, see customized products 141, 150, 295, 403
- Titanium alloy, see material 289, 291, 396, 466
- Tolerances
  - Customized bearings for aeroengine solutions 448
  - Rolling bearings 45
  - Self-lubricating journal bearings 396
  - Spherical plain bearings 140, 149
- Tooling and checking balls, see aerospace specialty and engineered balls 463
- Tool steel, see material 466
- Torque
  - Rod ends 285, 291
  - Rolling bearings 41
  - Self-lubricating journal bearings 394
  - Spherical plain bearings 146
- TPU, see material 470
- Tube
  - Engineered composite solutions 440

## U

- UFJ/XRE..., see cross-reference to legacy products 295
- UFJ/XRL..., see cross-reference to legacy products 295
- Ultimate static loads
  - Spherical plain bearings 135
- Ultra-Slim thin section bearings
  - Aerospace thin section bearings 461
- UMJ/XRE..., see cross-reference to legacy products 295
- UMJ/XRL..., see cross-reference to legacy products 295
- Units 6
- Universal joint
  - Engineered composite solutions 441
- Unlined journal bearings
  - Self-lubricating journal bearings 403
- Unloaded torque
  - Spherical plain bearings 146
- Use cases 13

## V

- Vertical groove, see keyway 282, 293
- Viton, see material 461

## W

- Wear rate
  - Spherical plain bearings 145
- Wear resistance
  - Spherical plain bearings 131
- Wear-resistant coating
  - Engineered pulleys 432
- Wear sleeves, see aerospace sealing solutions 469
- Wide, see bearing geometries 132, 142
- Wiper seals, see aerospace sealing solutions 469

## X

- X1
  - Self-lubricating journal bearings 392, 403
  - Spherical plain bearings 148
- X1-40
  - Self-lubricating journal bearings 392
  - Spherical plain bearings 148
- X40CrMoVN16.2, see material 449
- X105CrMo17, see material 46, 138, 139, 432, 437, 449
- XCR, see surface treatments 139, 149
- XLHP, see coating 148
- XLNT, see coating 148
- XL, see coating 148
- XRA..., see cross-reference to legacy products 151
- XRE...A..., see cross-reference to legacy products 151
- XRE..., see cross-reference to legacy products 151
- XRL..., see cross-reference to legacy products 151

## Z

- Z6CNU17.04, see material 46, 139, 148, 289, 291
- Z15CN17.03, see material 46, 286, 437
- Z100CD17, see material 46, 138, 139, 148, 432, 437, 449
- Zinc-nickel, see surface treatments 46, 139, 149, 286, 290, 292, 401

# Table index

11BH..

13ASF..

| Designation                                                 | Product                                                                                                         | Product table No. Page <sup>1)</sup> | Designation | Product                                                                                                                       | Product table No. Page <sup>1)</sup> |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| 11BH..                                                      | Airframe spherical plain bearings – Self-lubricating high misalignment (inch dimensions), no coating            | 2.32 258                             | 11LBN..     | For the cross-reference designation of this legacy product, see NAS..A..                                                      |                                      |
| 11BN..                                                      | For the cross-reference designation of this legacy product, see NAS..                                           |                                      | 11LBW..     | For the cross-reference designation of this legacy product, see WAS..A..                                                      |                                      |
| 11BW..                                                      | For the cross-reference designation of this legacy product, see WAS..                                           |                                      | 11LHN..     | For the cross-reference designation of this legacy product, see NAS..A..                                                      |                                      |
| 11C..E.. for bore code 5                                    | For the cross-reference designation of this legacy product, see WEN..                                           |                                      | 11LHW..     | For the cross-reference designation of this legacy product, see WAS..A..                                                      |                                      |
| 11C..E.. for bore code 8 and ≥ 12 (except 2 <sup>2)</sup> ) | For the cross-reference designation of this legacy product, see NEN..                                           |                                      | 11NH..      | Airframe spherical plain bearings – Self-lubricating high misalignment (inch dimensions), XLNT coated sphere                  | 2.32 258                             |
| 11C..N.. for bore code ≥ 12                                 | For the cross-reference designation of this legacy product, see LEN..                                           |                                      | 12BF..      | For the cross-reference designation of this legacy product, see FJ/WAS.., EFJ/WAS.., SFJ/WAS.., SEFJ/WAS..                    |                                      |
| 11C..N.. for bore codes 6 and 10                            | For the cross-reference designation of this legacy product, see NEN..                                           |                                      | 12BM..      | For the cross-reference designation of this legacy product, see MJ/WAS.., EMJ/WAS.., SMJ/WAS.., SEMJ/WAS..                    |                                      |
| 11C..W.. for bore code ≥ 6                                  | For the cross-reference designation of this legacy product, see WEN..                                           |                                      | 12BNF..     | For the cross-reference designation of this legacy product, see FJ/NAS.., EFJ/NAS.., SFJ/NAS.., SEFJ/NAS..                    |                                      |
| 11C..W.. for bore codes 5 and 22                            | For the cross-reference designation of this legacy product, see NEN..                                           |                                      | 12BNM..     | For the cross-reference designation of this legacy product, see MJ/NAS.., EMJ/NAS.., SMJ/NAS.., SEMJ/NAS..                    |                                      |
| 11DH..                                                      | Airframe spherical plain bearings – Self-lubricating high misalignment (inch dimensions), XCR plating on sphere | 2.32 258                             | 12CF..      | For the cross-reference designation of this legacy product, see PHFJ/WAS.., EPHFJ/WAS..                                       |                                      |
| 11E..H..                                                    | For the cross-reference designation of this legacy product, see HMEN..                                          |                                      | 12CM..      | For the cross-reference designation of this legacy product, see PHMJ/WAS.., EPHMJ/WAS..                                       |                                      |
| 11F..E.. for bore code 5                                    | For the cross-reference designation of this legacy product, see WEN..                                           |                                      | 12CNF..     | For the cross-reference designation of this legacy product, see PHFJ/NAS.., EPHFJ/NAS..                                       |                                      |
| 11F..E.. for bore code 8 and ≥ 12 (except 2 <sup>2)</sup> ) | For the cross-reference designation of this legacy product, see NEN..                                           |                                      | 12CNM..     | For the cross-reference designation of this legacy product, see PHMJ/NAS.., EPHMJ/NAS..                                       |                                      |
| 11F..N.. for bore code ≥ 12                                 | For the cross-reference designation of this legacy product, see LEN..                                           |                                      | 13AAF..     | Airframe self-lubricating journal bearings – Flanged bearings, NSA 8148, inch dimensions, aluminium alloy, liner X1           | 4.8 418                              |
| 11F..N.. for bore codes 6 and 10                            | For the cross-reference designation of this legacy product, see NEN..                                           |                                      | 13AAZ..     | Airframe self-lubricating journal bearings – Plain bearings, NSA 8146, inch dimensions, aluminium alloy, liner X1             | 4.5 412                              |
| 11F..W.. for bore code ≥ 6                                  | For the cross-reference designation of this legacy product, see WEN..                                           |                                      | 13ASF..     | Airframe self-lubricating journal bearings – Flanged bearings, NSA 8147, inch dimensions, corrosion-resistant-steel, liner X1 | 4.8 418                              |
| 11F..W.. for bore codes 5 and 22                            | For the cross-reference designation of this legacy product, see NEN..                                           |                                      |             |                                                                                                                               |                                      |
| 11HH..                                                      | Airframe spherical plain bearings – Self-lubricating high misalignment (inch dimensions), XL coated sphere      | 2.32 258                             |             |                                                                                                                               |                                      |
| 11HN..                                                      | For the cross-reference designation of this legacy product, see NAS..                                           |                                      |             |                                                                                                                               |                                      |
| 11HW..                                                      | For the cross-reference designation of this legacy product, see WAS..                                           |                                      |             |                                                                                                                               |                                      |
| 11KH..                                                      | Airframe spherical plain bearings – Self-lubricating high misalignment (inch dimensions), XLHT coated sphere    | 2.32 258                             |             |                                                                                                                               |                                      |

<sup>1)</sup> Starting page of the product table.



| Designation | Product                                                                                                                              | Product<br>table<br>No. Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                            | Product<br>table<br>No. Page <sup>1)</sup> |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 13ASZ..     | Airframe self-lubricating journal bearings – Plain bearings, NSA 8145, inch dimensions, corrosion-resistant-steel, liner X1          | 4.5 412                                    | ..AAK       | Airframe self-lubricating journal bearings – Plain bearings, EN 2285, metric dimensions, aluminium alloy 2024, liner Fiberslip                                                                     | 4.1 404                                    |
| 13BAF..     | Airframe self-lubricating journal bearings – Flanged bearings, AS 81934/2, inch dimensions, aluminium alloy                          | 4.9 420                                    | AG..        | Airframe rolling bearings – Deep groove ball bearing double row (metric dimensions), not plated bearing steel                                                                                      | 1.5 60                                     |
| 13BAZ..     | Airframe self-lubricating journal bearings – Plain bearings, AS 81934/1, inch dimensions, aluminium alloy                            | 4.6 414                                    | AGN..       | Airframe rolling bearings – Deep groove ball bearing double row, EN 3056 (metric dimensions), not plated bearing steel                                                                             | 1.6 62                                     |
| 13BSF..     | Airframe self-lubricating journal bearings – Flanged bearings, AS 81934/2, inch dimensions, corrosion-resistant-steel                | 4.9 420                                    | ..AK        | Airframe self-lubricating journal bearings – Plain bearings, metric dimensions, aluminium alloy 2618, liner Fiberslip                                                                              | 4.1 404                                    |
| 13BSZ..     | Airframe self-lubricating journal bearings – Plain bearings, AS 81934/1, inch dimensions, corrosion-resistant-steel                  | 4.6 414                                    | AS 14101    | For bearings according to this standard, see NAS.., ZNAS.., SZNAS.., ENAS.., ZENAS.., SZENAS..                                                                                                     |                                            |
| 13C..AAF    | Airframe self-lubricating journal bearings – Flanged bearings, EN 2286, metric dimensions, aluminium alloy 2024, liner X1            | 4.3 408                                    | AS 14102    | For bearings according to this standard, see WAS.., ZWAS.., SZWAS.., EWAS.., ZEWS.., SEZEWAS..                                                                                                     |                                            |
| 13C..AAZ    | Airframe self-lubricating journal bearings – Plain bearings, EN 2285, metric dimensions, aluminium alloy 2024, liner X1              | 4.1 404                                    | AS 14103    | For bearings according to this standard, see WAS.., ZWAS.., SZWAS.., EWAS.., ZEWS.., SEZEWAS..                                                                                                     |                                            |
| 13C..AF     | Airframe self-lubricating journal bearing – Flanged bearings, metric dimensions, aluminium alloy 2618, liner X1                      | 4.3 408                                    | AS 14104    | For bearings according to this standard, see NAS.., ZNAS.., SZNAS.., ENAS.., ZENAS.., SZENAS..                                                                                                     |                                            |
| 13C..AZ     | Airframe self-lubricating journal bearing – Plain bearings, metric dimensions, aluminium alloy 2618, liner X1                        | 4.1 404                                    | AS 21151    | For bearings according to this standard, see REP..M.., RA..M.., RAP..M.., REP..MR.., SREP..M.., SRA..M.., SRAP..M.., SREP..MR.., REP..ML.., RA..ML.., RAP..ML.., SREP..ML.., SRA..ML.., SRAP..ML.. |                                            |
| 13C..SF     | Airframe self-lubricating journal bearing – Flanged bearings, EN 2288, metric dimensions, corrosion-resistant-steel 17-4PH, liner X1 | 4.3 408                                    | AS 21153    | For bearings according to this standard, see REP.., REP..F.., SREP.., SREP..F.., REP..L.., REP..FL.., SREP..L.., SREP..FL..                                                                        |                                            |
| 13C..SZ     | Airframe self-lubricating journal bearing – Plain bearings, EN 2287, metric dimensions, corrosion-resistant-steel 17-4PH, liner X1   | 4.1 404                                    | AS 21154    | For bearings according to this standard, see ZWME.., ZWQME.., SZWQME..                                                                                                                             |                                            |
| 13D..AF     | Airframe self-lubricating journal bearing – Flanged bearings, metric dimensions, aluminium alloy                                     | 4.4 410                                    | AS 21155    | For bearings according to this standard, see ZWME.., ZWQME.., SZWQME..                                                                                                                             |                                            |
| 13D..AZ     | Airframe self-lubricating journal bearings – Plain bearings, metric dimensions, aluminium alloy                                      | 4.2 406                                    | AS 21428    | For bearings according to this standard, see MB5.., SMB5..                                                                                                                                         |                                            |
| 13D..SF     | Airframe self-lubricating journal bearings – Flanged bearings, metric dimensions, corrosion-resistant-steel                          | 4.4 410                                    | AS 27640    | For bearings according to this standard, see KP.., KP..L, SKP.., SKP..L                                                                                                                            |                                            |
| 13D..SZ     | Airframe self-lubricating journal bearings – Plain bearings, metric dimensions, aluminium alloy                                      | 4.2 406                                    | AS 27641    | For bearings according to this standard, see KP..A, SKP..A                                                                                                                                         |                                            |
| 13EAF..     | Airframe self-lubricating journal bearings – Flanged bearings, EN 4535-2, aluminium alloy                                            | 4.10 422                                   | AS 27642    | For bearings according to this standard, see KP..B, SKP..B                                                                                                                                         |                                            |
| 13EAZ..     | Airframe self-lubricating journal bearings – Plain bearings, EN 4534-2, inch dimensions, aluminium alloy                             | 4.7 416                                    | AS 27643    | For bearings according to this standard, see KP.., KSP..A, KSP..L, SKSP.., SKSP..A, SKSP..L                                                                                                        |                                            |
| 13ESF..     | Airframe self-lubricating journal bearings – Flanged bearings, EN 4537-2, corrosion-resistant-steel                                  | 4.10 422                                   | AS 27644    | For bearings according to this standard, see DPP.., SDPP..                                                                                                                                         |                                            |
| 13ESZ..     | Airframe self-lubricating journal bearings – Plain bearings, EN 4536-2, inch dimensions, corrosion-resistant-steel                   | 4.7 416                                    | AS 27646    | For bearings according to this standard, see B5.., SB5..                                                                                                                                           |                                            |
|             |                                                                                                                                      |                                            | AS 27646    | For bearings according to this standard, see DSP.., SDSP..                                                                                                                                         |                                            |
|             |                                                                                                                                      |                                            | AS 27647    | For bearings according to this standard, see DW.., DW..K2, DW..K, SDW.., SDW..K2, SDW..K                                                                                                           |                                            |
|             |                                                                                                                                      |                                            | AS 27648    | For bearings according to this standard, see KP..BS, SKP..BS                                                                                                                                       |                                            |
|             |                                                                                                                                      |                                            | AS 81820/1  | For bearings according to this standard, see NAS..A.., ZNAS..A.., SZNAS..A.., ENAS..A.., ZENAS..A.., SZENAS..A..                                                                                   |                                            |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                            | Product table No. | Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                            | Product table No. | Page <sup>1)</sup> |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| AS 81820/2  | For bearings according to this standard, see WAS..A., ZWAS..A., SZWAS..A., EWAS..A., ZEWAS..A., SZEWAS..A..                                                                        |                   |                    | CN..JESP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in bearing steel and rod end body in cadmium plated steel with UNJF profile thread   | 3.14              | 322                |
| AS 81820/3  | For bearings according to this standard, see WAS..A., ZWAS..A., SZWAS..A., EWAS..A., ZEWAS..A., SZEWAS..A..                                                                        |                   |                    | CN..JSP..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in bearing steel and rod end body in cadmium plated steel with UNJF profile thread | 3.14              | 322                |
| AS 81820/4  | For bearings according to this standard, see NAS..A., ZNAS..A., SZNAS..A., ENAS..A., ZENAS..A., SZENAS..A..                                                                        |                   |                    | CN..M       | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in bearing steel and rod end body in cadmium plated steel                        | 3.2               | 298                |
| AS 81934/1  | For bearings according to this standard, see 13BAZ.., 13BSZ..                                                                                                                      |                   |                    | CN..ME      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in bearing steel and rod end body in cadmium plated steel                          | 3.2               | 298                |
| AS 81934/2  | For bearings according to this standard, see 13BAF.., 13BSF..                                                                                                                      |                   |                    | CN..MESP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in bearing steel and rod end body in cadmium plated steel with UNF profile thread    | 3.2               | 298                |
| AS 81935/1  | For bearings according to this standard, see MJ/WAS.., EMJ/WAS..                                                                                                                   |                   |                    | CN..MESP1   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in bearing steel and rod end body in cadmium plated steel                          | 3.1               | 296                |
| AS 81935/2  | For bearings according to this standard, see FJ/WAS.., EFJ/WAS..                                                                                                                   |                   |                    | CN..MJ..    | Airframe rod ends – External thread rod end with integrated rolling bearing, EN 3541 (metric dimensions), bearing in bearing steel and rod end body in cadmium plated steel                        | 3.14              | 322                |
| AS 81935/4  | For bearings according to this standard, see MJ/NAS.., EMJ/NAS..                                                                                                                   |                   |                    | CN..MSP..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in bearing steel and rod end body in cadmium plated steel with UNF profile thread  | 3.2               | 298                |
| AS 81935/5  | For bearings according to this standard, see FJ/NAS.., EFJ/NAS..                                                                                                                   |                   |                    | CN..MSP1    | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in bearing steel and rod end body in cadmium plated steel                        | 1.20              | 98                 |
| AS 81935/6  | For bearings according to this standard, see EPHMJ/WAS.., PHMJ/WAS..                                                                                                               |                   |                    | DPP..       | Airframe rolling bearings – Deep groove ball bearing double row, AS 27644 (inch dimensions), cadmium plated bearing steel, standard tolerance                                                      | 1.26              | 114                |
| AS 81935/7  | For bearings according to this standard, see PHFJ/WAS.., EPHFJ/WAS..                                                                                                               |                   |                    | DSP..       | Airframe rolling bearings – Self-aligning ball bearing double row, AS 27643 (inch dimensions), cadmium plated bearing steel, standard tolerance                                                    | 1.27              | 116                |
| AS 81935/8  | For bearings according to this standard, see PHMJ/NAS.., EPHMJ/NAS..                                                                                                               |                   |                    | DSRP..      | Airframe rolling bearings – Spherical roller bearing single row (inch dimensions), cadmium plated bearing steel                                                                                    | 1.21              | 100                |
| AS 81935/9  | For bearings according to this standard, see PHFJ/NAS.., EPHFJ/NAS..                                                                                                               |                   |                    | DW..        | Airframe rolling bearings – Deep groove ball bearing double row, AS 27647 (inch dimensions), cadmium plated bearing steel, standard tolerance                                                      |                   |                    |
| AS 81936/1  | For bearings according to this standard, see QXMB..                                                                                                                                |                   |                    |             |                                                                                                                                                                                                    |                   |                    |
| AS 81936/2  | For bearings according to this standard, see QXMB..                                                                                                                                |                   |                    |             |                                                                                                                                                                                                    |                   |                    |
| B5..        | Airframe rolling bearings – Deep groove ball bearing single row, AS 27646 (inch dimensions), cadmium plated bearing steel, standard tolerance                                      | 1.18              | 92                 |             |                                                                                                                                                                                                    |                   |                    |
| B55..       | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated bearing steel                                                                    | 1.19              | 96                 |             |                                                                                                                                                                                                    |                   |                    |
| C..M        | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in bearing steel and rod end body in cadmium plated steel        | 3.2               | 298                |             |                                                                                                                                                                                                    |                   |                    |
| C..ME       | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in bearing steel and rod end body in cadmium plated steel          | 3.2               | 298                |             |                                                                                                                                                                                                    |                   |                    |
| C..MJ..     | Airframe rod ends – External thread rod end with integrated rolling bearing, EN 3541 (metric dimensions), bearing in bearing steel and rod end body in cadmium plated steel        | 3.1               | 296                |             |                                                                                                                                                                                                    |                   |                    |
| CN..-..     | Airframe rod ends – External thread rod end with integrated rolling bearing, EN 4156 (inch dimensions), shielded bearing in bearing steel and rod end body in cadmium plated steel | 3.15              | 326                |             |                                                                                                                                                                                                    |                   |                    |
| CN..E..     | Airframe rod ends – External thread rod end with integrated rolling bearing, EN 4156 (inch dimensions), sealed bearing in bearing steel and rod end body in cadmium plated steel   | 3.15              | 326                |             |                                                                                                                                                                                                    |                   |                    |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                                                                                          | Product<br>table<br>No. Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                                                                                                       | Product<br>table<br>No. Page <sup>1)</sup> |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| DW..K       | Airframe rolling bearings – Deep groove ball bearing double row, AS 27647 (inch dimensions), cadmium plated bearing steel, standard tolerance                                                                                                                    | 1.21 100                                   | EFJ/QMTC..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.35 380                                   |
| DW..K2      | Airframe rolling bearings – Deep groove ball bearing double row, AS 27647 (inch dimensions), cadmium plated bearing steel, standard tolerance                                                                                                                    | 1.21 100                                   | EFJ/QMTC..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                               |                                            |
| EF..        | Airframe rod ends – Internal thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel inner ring and cadmium plated steel rod end body                                                                         | 3.11 316                                   | EFJ/QMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.35 380                                   |
| EFJ/NAS..   | Airframe rod ends – Internal thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/5 (inch dimensions), PH13.8 inner ring and cadmium plated 4340 steel rod end body                                                                 | 3.27 358                                   | EFJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                               |                                            |
| EFJ/NAS..   | For the bearing used in this rod end, see NAS..                                                                                                                                                                                                                  |                                            | EFJ/QMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.35 380                                   |
| EFJ/QML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                    | 3.12 318                                   | EFJ/QMTS..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                               |                                            |
| EFJ/QML..   | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                  |                                            | EFJ/RL..    | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions), cadmium plated 30NCD16 steel rod end                                                                                                                  | 3.6 306                                    |
| EFJ/QMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.34 378                                   | EFJ/RL..    | For the bearing used in this rod end, see WEN..                                                                                                                                                                                                                               |                                            |
| EFJ/QMLC..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                  |                                            | EFJ/RL..R.. | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), cadmium plated 30NCD16 steel rod end                                                                                                                    | 3.30 370                                   |
| EFJ/QML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.34 378                                   | EFJ/RL..R.. | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                               |                                            |
| EFJ/QML..R  | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                  |                                            | EFJ/RT..    | Airframe rod ends – Internal thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions), cadmium plated 30NCD16 steel rod end                                                                                                     | 3.7 308                                    |
| EFJ/QMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.34 378                                   | EFJ/RT..    | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                               |                                            |
| EFJ/QMLS..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                  |                                            | EFJ/RT..R.. | Airframe rod ends – Internal thread inserted high-misalignment self-lubricating spherical plain bearing rod end (inch dimensions), cadmium plated 30NCD16 steel rod end                                                                                                       | 3.31 372                                   |
| EFJ/QMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                       | 3.13 320                                   | EFJ/RT..R.. | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                               |                                            |
| EFJ/QMT..   | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                  |                                            | EFJ/WAS..   | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/2 (inch dimensions), PH13.8 inner ring and cadmium plated 4340 steel rod end body                                                                                | 3.25 350                                   |
|             |                                                                                                                                                                                                                                                                  |                                            | EFJ/WAS..   | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                               |                                            |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                                                                                                                | Product table No. | Page <sup>1)</sup> |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| EFJ/WML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                                 | 3.12              | 318                |
| EFJ/WML..   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                        |                   |                    |
| EFJ/WMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body              | 3.34              | 378                |
| EFJ/WMLC..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                        |                   |                    |
| EFJ/WML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove                        | 3.34              | 378                |
| EFJ/WML..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                        |                   |                    |
| EFJ/WMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.34              | 378                |
| EFJ/WMLS..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                        |                   |                    |
| EFJ/WMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                    | 3.13              | 320                |
| EFJ/WMT..   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                        |                   |                    |
| EFJ/WMTC..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.35              | 380                |
| EFJ/WMTC..R | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                        |                   |                    |
| EFJ/WMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.35              | 380                |
| EFJ/WMT..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                        |                   |                    |

| Designation  | Product                                                                                                                                                                                                                                                                              | Product table No. | Page <sup>1)</sup> |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| EFJ/WMTS..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring | 3.35              | 380                |
| EFJ/WMTS..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                      |                   |                    |
| EFJ/WQML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                                        | 3.12              | 318                |
| EFJ/WQML..   | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                     |                   |                    |
| EFJ/WQMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body                     | 3.34              | 378                |
| EFJ/WQMLC..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                     |                   |                    |
| EFJ/WQML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove                               | 3.34              | 378                |
| EFJ/WQML..R  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                     |                   |                    |
| EFJ/WQMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring                       | 3.34              | 378                |
| EFJ/WQMLS..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                     |                   |                    |
| EFJ/WQMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                           | 3.13              | 320                |
| EFJ/WQMT..   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                     |                   |                    |
| EFJ/WQMTC..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body        | 3.35              | 380                |
| EFJ/WQMTC..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                     |                   |                    |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                                                                                                                                     | Product<br>table<br>No. Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                                                                                                       | Product<br>table<br>No. Page <sup>1)</sup> |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| EFJ/WQMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove         | 3.35 380                                   | EMJ/QMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.32 374                                   |
| EFJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                            |                                            | EMJ/QMLS..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                               |                                            |
| EFJ/WQMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring | 3.35 380                                   | EMJ/QMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                    | 3.10 314                                   |
| EFJ/WQMTS..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                            |                                            | EMJ/QMT..   | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                               |                                            |
| EM..         | Airframe rod ends – External thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel inner ring and cadmium plated steel rod end body                                                                                    | 3.8 310                                    | EMJ/QMTC..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.33 376                                   |
| EMA..        | Airframe rod ends – External thread inserted self-lubricating spherical plain bearing rod end, EN 2498 (metric dimensions), cadmium plated 30NCD16 steel rod end                                                                                                            | 3.3 300                                    | EMJ/QMTC..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                               |                                            |
| EMA..        | For the bearing used in this rod end, see HMEN..R..                                                                                                                                                                                                                         |                                            | EMJ/QMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.33 376                                   |
| EMJ/NAS..    | Airframe rod ends – External thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/4 (inch dimensions), PH13.8 inner ring and cadmium plated 4340 steel rod end body                                                                            | 3.20 340                                   | EMJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                               |                                            |
| EMJ/NAS..    | For the bearing used in this rod end, see ENAS..                                                                                                                                                                                                                            |                                            | EMJ/QMTS..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.33 376                                   |
| EMJ/QML..    | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                               | 3.9 312                                    | EMJ/QMTS..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                               |                                            |
| EMJ/QML..    | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                             |                                            | EMJ/RL..    | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions), cadmium plated 30NCD16 steel rod end                                                                                                                  | 3.4 302                                    |
| EMJ/QMLC..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body            | 3.32 374                                   | EMJ/RL..    | For the bearing used in this rod end, see WEN..                                                                                                                                                                                                                               |                                            |
| EMJ/QMLC..R  | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                             |                                            | EMJ/RL..R.. | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), cadmium plated 30NCD16 steel rod end                                                                                                                    | 3.23 346                                   |
| EMJ/QML..R   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove                      | 3.32 374                                   | EMJ/RL..R.. | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                               |                                            |
| EMJ/QML..R   | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                             |                                            | EMJ/RT..    | Airframe rod ends – External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions), cadmium plated 30NCD16 steel rod end                                                                                                     | 3.5 304                                    |
|              |                                                                                                                                                                                                                                                                             |                                            | EMJ/RT..    | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                               |                                            |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                                                                                                   | Product table No. | Page <sup>1)</sup> |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| EMJ/RT..R.. | Airframe rod ends – External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (inch dimensions), cadmium plated 30NCD16 steel rod end                                                                                                   | 3.24              | 348                |
| EMJ/RT..R.. | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                           |                   |                    |
| EMJ/WAS..   | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/1 (inch dimensions), PH13.8 inner ring and cadmium plated 4340 steel rod end body                                                                            | 3.18              | 336                |
| EMJ/WAS..   | For the bearing used in this rod end, see EWAS..                                                                                                                                                                                                                          |                   |                    |
| EMJ/WML..   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                    | 3.9               | 312                |
| EMJ/WML..   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                           |                   |                    |
| EMJ/WMLC..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.32              | 374                |
| EMJ/WMLC..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                           |                   |                    |
| EMJ/WML..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.32              | 374                |
| EMJ/WML..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                           |                   |                    |
| EMJ/WMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.32              | 374                |
| EMJ/WMLS..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                           |                   |                    |
| EMJ/WMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                       | 3.10              | 314                |
| EMJ/WMT..   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                           |                   |                    |

| Designation  | Product                                                                                                                                                                                                                                                                                | Product table No. | Page <sup>1)</sup> |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| EMJ/WMTC..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.33              | 376                |
| EMJ/WMTC..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                        |                   |                    |
| EMJ/WMT..R   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.33              | 376                |
| EMJ/WMT..R   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                        |                   |                    |
| EMJ/WMTS..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.33              | 376                |
| EMJ/WMTS..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                        |                   |                    |
| EMJ/WQML..   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                                          | 3.9               | 312                |
| EMJ/WQML..   | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                       |                   |                    |
| EMJ/WQMLC..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body                       | 3.32              | 374                |
| EMJ/WQMLC..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                       |                   |                    |
| EMJ/WQML..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove                                 | 3.32              | 374                |
| EMJ/WQML..R  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                       |                   |                    |
| EMJ/WQMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring                         | 3.32              | 374                |
| EMJ/WQMLS..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                       |                   |                    |

<sup>1)</sup> Starting page of the product table.



| Designation   | Product                                                                                                                                                                                                                                                                       | Product table<br>No. Page <sup>1)</sup> | Designation | Product                                                                 | Product table<br>No. Page <sup>1)</sup> |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------|-------------------------------------------------------------------------|-----------------------------------------|
| EMJ/WQMT..    | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                    | 3.10 314                                | EN 3054     | For bearings according to this standard, see ZK.., ZKN.., ZK..F, ZKN..F |                                         |
| EMJ/WQMT..    | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                              |                                         | EN 3055     | For bearings according to this standard, see WK.., WKN.., WK..F, WKN..F |                                         |
| EMJ/WQMTTC..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body | 3.33 376                                | EN 3056     | For bearings according to this standard, see AGN..                      |                                         |
| EMJ/WQMTTC..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                              |                                         | EN 3057     | For bearings according to this standard, see ZAGN..                     |                                         |
| EMJ/WQMT..R   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove           | 3.33 376                                | EN 3058     | For bearings according to this standard, see WAGN..                     |                                         |
| EMJ/WQMT..R   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                              |                                         | EN 3059     | For bearings according to this standard, see TRCE.., STRCE..            |                                         |
| EMJ/WQMT..R   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring   | 3.33 376                                | EN 3060     | For bearings according to this standard, see ZTRCE.., SZTRCE..          |                                         |
| EMJ/WQMT..R   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                              |                                         | EN 3061     | For bearings according to this standard, see XTRCE..                    |                                         |
| EMJ/WQMTS..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), cadmium plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring   | 3.33 376                                | EN 3281     | For bearings according to this standard, see TA..                       |                                         |
| EMJ/WQMTS..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                              |                                         | EN 3282     | For bearings according to this standard, see ZTA..                      |                                         |
| EN 2285       | For bearings according to this standard, see 13C..AAZ, ..AAK                                                                                                                                                                                                                  |                                         | EN 3283     | For bearings according to this standard, see WATA..                     |                                         |
| EN 2286       | For bearings according to this standard, see 13C..AAF, ..FAAK                                                                                                                                                                                                                 |                                         | EN 3284     | For bearings according to this standard, see JNA..                      |                                         |
| EN 2287       | For bearings according to this standard, see 13C..SZ, ..SK                                                                                                                                                                                                                    |                                         | EN 3285     | For bearings according to this standard, see ZJNA..                     |                                         |
| EN 2288       | For bearings according to this standard, see 13C..SF                                                                                                                                                                                                                          |                                         | EN 3286     | For bearings according to this standard, see WJNA..                     |                                         |
| EN 2335       | For bearings according to this standard, see WMA..                                                                                                                                                                                                                            |                                         | EN 3287     | For bearings according to this standard, see KN..                       |                                         |
| EN 2336       | For bearings according to this standard, see GE..                                                                                                                                                                                                                             |                                         | EN 3288     | For bearings according to this standard, see ZKN..                      |                                         |
| EN 2498       | For bearings according to this standard, see EMA..                                                                                                                                                                                                                            |                                         | EN 3289     | For bearings according to this standard, see WKN..                      |                                         |
| EN 2584       | For bearings according to this standard, see NEN..                                                                                                                                                                                                                            |                                         | EN 3290     | For bearings according to this standard, see KNA..F                     |                                         |
| EN 2585       | For bearings according to this standard, see WEN..                                                                                                                                                                                                                            |                                         | EN 3291     | For bearings according to this standard, see ZKNA..F                    |                                         |
| EN 2588       | For bearings according to this standard, see WGE..                                                                                                                                                                                                                            |                                         | EN 3292     | For bearings according to this standard, see WKNA..F                    |                                         |
| EN 2618       | For bearings according to this standard, see 13C..AZ, ..AK, 13C..AF, ..FSK                                                                                                                                                                                                    |                                         | EN 3541     | For bearings according to this standard, see C..MJ.., C..MJ..           |                                         |
| EN 3045       | For bearings according to this standard, see JNA..                                                                                                                                                                                                                            |                                         | EN 4034     | For bearings according to this standard, see WKNRCE..                   |                                         |
| EN 3046       | For bearings according to this standard, see ZJNA..                                                                                                                                                                                                                           |                                         | EN 4036     | For bearings according to this standard, see XC..MJ.., XC..MJ..         |                                         |
| EN 3047       | For bearings according to this standard, see WJNA..                                                                                                                                                                                                                           |                                         | EN 4037     | For bearings according to this standard, see LEN..                      |                                         |
| EN 3048       | For bearings according to this standard, see LEN..                                                                                                                                                                                                                            |                                         | EN 4038     | For bearings according to this standard, see NEN..                      |                                         |
| EN 3053       | For bearings according to this standard, see K.., KN.., K..F, KN..F                                                                                                                                                                                                           |                                         | EN 4039     | For bearings according to this standard, see WEN..                      |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4040     | For bearings according to this standard, see HMEN..                     |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4041     | For bearings according to this standard, see TRCEI.., XTRCEI..          |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4156     | For bearings according to this standard, see CN..-.., CN..E..           |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4157     | For bearings according to this standard, see WCN..-.., WCN..E..         |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4198     | For bearings according to this standard, see XEMA..                     |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4265     | For bearings according to this standard, see ENL..                      |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4266     | For bearings according to this standard, see ZENL..                     |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4534-2   | For bearings according to this standard, see 13EAF..                    |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4535-2   | For bearings according to this standard, see 13EAF..                    |                                         |
|               |                                                                                                                                                                                                                                                                               |                                         | EN 4536-2   | For bearings according to this standard, see 13ESZ..                    |                                         |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                  | Product table No. Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                        | Product table No. Page <sup>1)</sup> |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| EN 4537-2   | For bearings according to this standard, see 13ESF..                                                                                                                                     |                                      | FJ/NAS..    | Airframe rod ends – Internal thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/5 (inch dimensions), 440C inner ring and cadmium plated 4340 steel rod end body | 3.27 358                             |
| EN 6046     | For bearings according to this standard, see ENE.., ZENE..                                                                                                                               |                                      | FJ/NAS..    | For the bearing used in this rod end, see NAS..                                                                                                                                                |                                      |
| ENAS..      | Airframe spherical plain bearings – Self-lubricating narrow, AS 14101, AS 14104 (inch dimensions), PH13.8 inner ring and not plated outer ring                                           | 2.26 236                             | FJ/WAS..    | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/2 (inch dimensions), 440C inner ring and cadmium plated 4340 steel rod end body   | 3.25 350                             |
| ENAS..      | For rod ends using this bearing, see EMJ/NAS.., SEMJ/NAS.., EPHMJ/NAS.., EFJ/NAS.., SEFJ/NAS.., PHFJ/NAS..                                                                               |                                      | FJ/WAS..    | For the bearing used in this rod end, see WAS..                                                                                                                                                |                                      |
| ENAS..A..   | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/1, AS 81820/4 (inch dimensions), PH13.8 inner ring and not plated outer ring                                       | 2.27 240                             | ..FSK       | Airframe self-lubricating journal bearings – Flanged bearings, EN 2288, metric dimensions, corrosion-resistant-steel 17-4PH, liner Fiberslip                                                   | 4.3 408                              |
| ENE..       | Airframe spherical plain bearings – Metal-to-metal swaged narrow, EN 6046 (inch dimensions), not plated                                                                                  | 2.12 190                             | ..FSK       | Airframe self-lubricating journal bearings – Flanged bearings, metric dimensions, aluminium alloy 2618, liner Fiberslip                                                                        | 4.3 408                              |
| ENL..       | Airframe spherical plain bearings – Metal-to-metal swaged wide, EN 4265 (inch dimensions), not plated                                                                                    | 2.14 198                             | GE..        | Airframe spherical plain bearings – Metal-to-metal loader slot, EN 2336 (metric dimensions), bearing steel inner ring and outer ring not plated                                                | 2.1 156                              |
| EPHFJ/NAS.. | Airframe rod ends – Internal thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/9 (inch dimensions), PH13.8 inner ring and passivated PH13.8 rod end body | 3.28 362                             | GL..        | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring not plated                                                  | 2.2 160                              |
| EPHFJ/NAS.. | For the bearing used in this rod end, see NAS..                                                                                                                                          |                                      | GLD..       | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring not plated                                                  | 2.2 160                              |
| EPHFJ/WAS.. | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/7 (inch dimensions), PH13.8 inner ring and passivated PH13.8 rod end body   | 3.26 354                             | GLS..       | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring not plated                                                  | 2.2 160                              |
| EPHFJ/WAS.. | For the bearing used in this rod end, see WAS..                                                                                                                                          |                                      | GLS..MRTG   | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), bearing steel inner ring and outer ring not plated with molybdenum disulfide             | 2.3 164                              |
| EPHMJ/NAS.. | Airframe rod ends – External thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/8 (inch dimensions), PH13.8 inner ring and passivated PH13.8 rod end body | 3.21 342                             | GLS..RTG    | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), bearing steel inner ring and outer ring not plated                                       | 2.3 164                              |
| EPHMJ/NAS.. | For the bearing used in this rod end, see ENAS..                                                                                                                                         |                                      | GLS..TAG    | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring not plated                                                  | 2.2 160                              |
| EPHMJ/WAS.. | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/6 (inch dimensions), PH13.8 inner ring and passivated PH13.8 rod end body   | 3.19 338                             | GT..        | Airframe spherical plain bearings – Metal-to-metal loader slot wide (metric dimensions), bearing steel inner ring and outer ring not plated                                                    | 2.4 166                              |
| EPHMJ/WAS.. | For the bearing used in this rod end, see EWAS..                                                                                                                                         |                                      | GT..        | Airframe spherical plain bearings – Metal-to-metal loader slot wide (inch dimensions), bearing steel inner ring and outer ring not plated                                                      | 2.10 184                             |
| EWAS..      | Airframe spherical plain bearings – Self-lubricating narrow, AS 14102, AS 14103 (inch dimensions), PH13.8 inner ring and not plated outer ring                                           | 2.29 248                             | HMEN..      | Airframe spherical plain bearings – Self-lubricating high-misalignment, EN 4040 (metric dimensions), not plated                                                                                | 2.21 224                             |
| EWAS..A..   | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/2, AS 81820/3 (inch dimensions), PH13.8 inner ring and not plated outer ring                                       | 2.30 252                             | HMEN..      | For rod ends using this bearing, see EMA.., SEMA.., XEMA.., TEMA..                                                                                                                             | 125                                  |
| ..FAAK      | Airframe self-lubricating journal bearings – Flanged bearings, EN 2286, metric dimensions, aluminium alloy 2024, liner Fiberslip                                                         | 4.3 408                              |             |                                                                                                                                                                                                |                                      |

<sup>1)</sup> Starting page of the product table.



| Designation | Product                                                                                                                                       | Product table<br>No. Page <sup>1)</sup> |     | Designation | Product                                                                                                                                                               | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| JN..        | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), not plated bearing steel                                 | 1.1                                     | 52  | KP..B       | Airframe rolling bearings – Deep groove ball bearing single row, AS 27642 (inch dimensions), cadmium plated bearing steel, standard tolerance                         | 1.16                                    | 84  |
| JNA..       | Airframe rolling bearings – Deep groove ball bearing single row, EN 3284, EN 3045 (metric dimensions), not plated bearing steel               | 1.2                                     | 54  | KP..BS      | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row, AS 27648 (inch dimensions), cadmium plated bearing steel, standard tolerance | 1.22                                    | 102 |
| K..         | Airframe rolling bearings – Spherical roller bearing single row, EN 3053 (metric dimensions), not plated bearing steel                        | 1.11                                    | 72  | KP..L       | Airframe rolling bearings – Deep groove ball bearing single row, AS 27640 (inch dimensions), cadmium plated bearing steel, standard tolerance                         | 1.14                                    | 78  |
| KAF..P      | Airframe self-lubricating journal bearings – Flanged bearings, NSA 8148, inch dimensions, aluminium alloy, liner Fiberslip                    | 4.8                                     | 418 | KP..LPSP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, shielded                                             | 1.17                                    | 90  |
| KA..P       | Airframe self-lubricating journal bearings – Plain bearings, NSA 8146, inch dimensions, aluminium alloy, liner Fiberslip                      | 4.5                                     | 412 | KP..LSP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, sealed                                               | 1.17                                    | 90  |
| K..D        | Airframe rolling bearings – Spherical roller bearing double row (metric dimensions), not plated bearing steel                                 | 1.13                                    | 76  | KP..PSP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, shielded                                             | 1.17                                    | 90  |
| K..F        | Airframe rolling bearings – Spherical roller bearing single row, EN 3053 (metric dimensions), not plated bearing steel                        | 1.11                                    | 72  | KP..SP..    | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, sealed                                               | 1.17                                    | 90  |
| KN..        | Airframe rolling bearings – Self-aligning ball bearing double row, EN 3287 (metric dimensions), not plated bearing steel                      | 1.9                                     | 68  | KSF..P      | Airframe self-lubricating journal bearings – Flanged bearings, NSA 8147, inch dimensions, corrosion-resistant-steel, liner Fiberslip                                  | 4.8                                     | 418 |
| KN..        | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), not plated bearing steel                                 | 1.25                                    | 112 | KS..P       | Airframe self-lubricating journal bearings – Plain bearings, NSA 8145, inch dimensions, corrosion-resistant-steel, liner Fiberslip                                    | 4.5                                     | 412 |
| KN..        | Airframe rolling bearings – Spherical roller bearing single row, EN 3053 (metric dimensions), not plated bearing steel                        | 1.11                                    | 72  | KSP..       | Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), cadmium plated bearing steel, standard tolerance                       | 1.23                                    | 106 |
| KNA..F      | Airframe rolling bearings – Spherical roller bearing single row, EN 3290 (metric dimensions), not plated bearing steel                        | 1.12                                    | 74  | KSP..A      | Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), cadmium plated bearing steel, standard tolerance                       | 1.23                                    | 106 |
| KN..F       | Airframe rolling bearings – Spherical roller bearing single row, EN 3053 (metric dimensions), not plated bearing steel                        | 1.11                                    | 72  | KSP..APSP.. | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated bearing steel, shielded                                           | 1.24                                    | 110 |
| KNRCE..     | Airframe rolling bearings – Self-aligning ball bearing double row (metric dimensions), not plated bearing steel                               | 1.10                                    | 70  | KSP..ASP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated bearing steel, sealed                                             | 1.24                                    | 110 |
| KP..        | Airframe rolling bearings – Deep groove ball bearing single row, AS 27640 (inch dimensions), cadmium plated bearing steel, standard tolerance | 1.14                                    | 78  | KSP..L      | Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), cadmium plated bearing steel, standard tolerance                       | 1.23                                    | 106 |
| KP..A       | Airframe rolling bearings – Deep groove ball bearing single row, AS 27641 (inch dimensions), cadmium plated bearing steel, standard tolerance | 1.15                                    | 80  | KSP..PSP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated bearing steel, shielded                                           | 1.24                                    | 110 |
| KP..APSP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, shielded                     | 1.17                                    | 90  | KSP..SP..   | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated bearing steel, sealed                                             | 1.24                                    | 110 |
| KP..ASP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, sealed                       | 1.17                                    | 90  |             |                                                                                                                                                                       |                                         |     |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                        | Product table No. | Page <sup>1)</sup> |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| LEN..       | Airframe spherical plain bearings – Self-lubricating light, EN 3048, EN 4037 (metric dimensions), not plated                                                                                   | 2.18              | 214                |
| MB5..       | Airframe rolling bearings – Deep groove ball bearing single row, AS 21428 (inch dimensions), cadmium plated bearing steel, reduced clearance and precision                                     | 1.18              | 92                 |
| MDPP..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                                     | 1.20              | 98                 |
| MDSP..      | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                                   | 1.26              | 114                |
| MDW..       | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                                     | 1.21              | 100                |
| MDW..K      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                                     | 1.21              | 100                |
| MDW..K2     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                                     | 1.21              | 100                |
| MJ/NAS..    | Airframe rod ends – External thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/4 (inch dimensions), 440C inner ring and cadmium plated 4340 steel rod end body | 3.20              | 340                |
| MJ/NAS..    | For the bearing used in this rod end, see NAS..                                                                                                                                                |                   |                    |
| MJ/WAS..    | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/1 (inch dimensions), 440C inner ring and cadmium plated 4340 steel rod end body   | 3.18              | 336                |
| MJ/WAS..    | For the bearing used in this rod end, see WAS..                                                                                                                                                |                   |                    |
| MKP..       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                                     | 1.14              | 78                 |
| MKP..A      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                                     | 1.15              | 80                 |
| MKP..B      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                                     | 1.16              | 84                 |
| MKP..BS     | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision             | 1.22              | 102                |

| Designation | Product                                                                                                                                                                                | Product table No. | Page <sup>1)</sup> |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| MKP..L      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                             | 1.14              | 78                 |
| MKSP..      | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                           | 1.23              | 106                |
| MKSP..A     | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                           | 1.23              | 106                |
| MKSP..L     | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated bearing steel, reduced tolerance and SKF super precision                           | 1.23              | 106                |
| NAS..       | Airframe spherical plain bearings – Self-lubricating narrow, AS 14101, AS 14104 (inch dimensions), 440C inner ring and not plated outer ring                                           | 2.26              | 236                |
| NAS..       | For rod ends using this bearing, see MJ/NAS.., SMJ/NAS.., PHMJ/NAS.., FJ/NAS.., SFJ/NAS.., PHFJ/NAS..                                                                                  |                   |                    |
| NAS..A..    | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/1, AS 81820/4 (inch dimensions), 440C inner ring and not plated outer ring                                       | 2.27              | 240                |
| NEN..       | Airframe spherical plain bearings – Self-lubricating narrow, EN 2584, EN 4038 (metric dimensions), not plated                                                                          | 2.19              | 216                |
| NSA 8134    | For bearings according to this standard, see SN..                                                                                                                                      |                   |                    |
| NSA 8135    | For bearings according to this standard, see SW..                                                                                                                                      |                   |                    |
| NSA 8136    | For bearings according to this standard, see SN..                                                                                                                                      |                   |                    |
| NSA 8137    | For bearings according to this standard, see SW..                                                                                                                                      |                   |                    |
| NSA 8143    | For bearings according to this standard, see R..M..                                                                                                                                    |                   |                    |
| NSA 8145    | For bearings according to this standard, see 13ASZ.., KS..P                                                                                                                            |                   |                    |
| NSA 8146    | For bearings according to this standard, see 13AAZ.., KA..P                                                                                                                            |                   |                    |
| NSA 8147    | For bearings according to this standard, see 13ASF.., KSF..P                                                                                                                           |                   |                    |
| NSA 8148    | For bearings according to this standard, see 13AAF.., KAF..P                                                                                                                           |                   |                    |
| NSA 8149    | For bearings according to this standard, see R..F..                                                                                                                                    |                   |                    |
| PHFJ/NAS..  | Airframe rod ends – Internal thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/9 (inch dimensions), 440C inner ring and passivated PH13.8 rod end body | 3.28              | 362                |
| PHFJ/NAS..  | For the bearing used in this rod end, see NAS..                                                                                                                                        |                   |                    |
| PHFJ/WAS..  | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/7 (inch dimensions), 440C inner ring and passivated PH13.8 rod end body   | 3.26              | 354                |
| PHFJ/WAS..  | For the bearing used in this rod end, see WAS..                                                                                                                                        |                   |                    |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                   | Product table No. | Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                                                                                                                                                                                                                                                                         | Product table No. | Page <sup>1)</sup> |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| PHMJ/NAS..  | Airframe rod ends – External thread inserted narrow self-lubricating spherical plain bearing rod end, AS 81935/8 (inch dimensions), 440C inner ring and passivated PH13.8 rod end body    | 3.21              | 342                | QGLS..MRTG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced , (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated with molybdenum disulfide                                                                                                                                                                                                                               | 2.3               | 164                |
| PHMJ/NAS..  | For the bearing used in this rod end, see NAS..                                                                                                                                           |                   |                    | QGLS..RTG   | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced , (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                         | 2.3               | 164                |
| PHMJ/WAS..  | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end, AS 81935/6 (inch dimensions), 440C inner ring and passivated PH13.8 rod end body      | 3.19              | 338                | QGLS..TAG   | Airframe spherical plain bearings – Metal-to-metal loader slot normal, (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                     | 2.2               | 160                |
| PHMJ/WAS..  | For the bearing used in this rod end, see WAS..                                                                                                                                           |                   |                    | QGT..       | Airframe spherical plain bearings – Metal-to-metal loader slot wide , (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                      | 2.4               | 166                |
| PHUFJ/XRE.. | For the cross-reference designation of this legacy product, see PHFJ/NAS.., EPHFJ/NAS..                                                                                                   |                   |                    | QGT..       | Airframe spherical plain bearings – Metal-to-metal loader slot wide, (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                         | 2.10              | 184                |
| PHUFJ/XRL.. | For the cross-reference designation of this legacy product, see PHFJ/WAS.., EPHFJ/WAS..                                                                                                   |                   |                    | QMA..       | Airframe spherical plain bearings – Metal-to-metal swaged light (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                            | 2.5               | 168                |
| PHUMJ/XRE.. | For the cross-reference designation of this legacy product, see PHMJ/NAS.., EPHMJ/NAS..                                                                                                   |                   |                    | QME..       | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                           | 2.6               | 172                |
| PHUMJ/XRL.. | For the cross-reference designation of this legacy product, see PHMJ/WAS.., EPHMJ/WAS..                                                                                                   |                   |                    | QME..       | Airframe spherical plain bearings – Metal-to-metal swaged narrow (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                             | 2.11              | 186                |
| Q2PL..      | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                      | 2.9               | 182                | QML..       | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                             | 2.7               | 176                |
| Q2PL..      | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                        | 2.17              | 210                | QML..       | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                               | 2.13              | 194                |
| QEF..       | Airframe rod ends – Internal thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel rod end body | 3.8               | 316                | QML..       | For rod ends using this bearing, see EMJ/QML.., SEMJ/QML.., TEMJ/QML.., EFJ/QML.., SEFJ/QML.., SEFJ/QML.., TEFJ/QML.., EMJ/QML..R, SEMJ/QML..R, SEMJ/QML..R, TEMJ/QML..R, EFJ/QML..R, SEFJ/QML..R, SEFJ/QML..R, TEFJ/QML..R, EMJ/QML..R, SEMJ/QML..R, XEMJ/QML..R, TEMJ/QML..R, EFJ/QML..R, SEFJ/QML..R, XEFJ/QML..R, TEFJ/QML..R, EMJ/QMLC..R, SEMJ/QMLC..R, XEMJ/QMLC..R, TEMJ/QMLC..R, EFJ/QMLC..R, SEFJ/QMLC..R, XEFJ/QMLC..R, TEFJ/QMLC..R |                   |                    |
| QEM..       | Airframe rod ends – External thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel rod end body | 3.8               | 310                |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |
| QGE..       | Airframe spherical plain bearings – Metal-to-metal loader slot (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                       | 2.1               | 156                |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |
| QGL..       | Airframe spherical plain bearings – Metal-to-metal loader slot normal, (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated               | 2.2               | 160                |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |
| QGLD..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal, (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated               | 2.2               | 160                |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |
| QGLS..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal, (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated               | 2.2               | 160                |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |

| Designation | Product                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Product table<br>No. Page <sup>1)</sup> |     | Designation | Product                                                                                                                                                                                           | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| QMT..       | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                                    | 2.8                                     | 180 | REP..FL..   | Airframe rod ends – Internal thread rod end with integrated rolling bearing, AS 21153 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with left-hand thread  | 3.17                                    | 334 |
| QMT..       | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring not plated                                                                                                                                                                                                                                                                                      | 2.15                                    | 202 | REP..L..    | Airframe rod ends – Internal thread rod end with integrated rolling bearing, AS 21153 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with left-hand thread  | 3.17                                    | 334 |
| QMT..       | For rod ends using this bearing, see EMJ/QMT.., SEMJ/QMT.., SEMJ/QMT.., TEMJ/QMT.., EFJ/QMT.., SEFJ/QMT.., SEFJ/QMT.., TEFJ/QMT.., EMJ/QMT..R, SEMJ/QMT..R, SEMJ/QMT..R, TEMJ/QMT..R, EFJ/QMT..R, SEFJ/QMT..R, SEFJ/QMT..R, TEFJ/QMT..R, EMJ/QMTS..R, SEMJ/QMTS..R, XEMJ/QMTS..R, TEMJ/QMTS..R, EFJ/QMTS..R, SEFJ/QMTS..R, XEFJ/QMTS..R, TEFJ/QMTS..R, EMJ/QMTC..R, SEMJ/QMTC..R, XEMJ/QMTC..R, TEMJ/QMTC..R, EFJ/QMTC..R, SEFJ/QMTC..R, XEFJ/QMTC..R, TEFJ/QMTC..R |                                         |     | REP..M..    | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with right-hand thread | 3.16                                    | 332 |
| QXMB..      | Airframe spherical plain bearings – Metal-to-metal swaged, AS 81936/1, AS 81936/2 (inch dimensions), not plated                                                                                                                                                                                                                                                                                                                                                     | 2.16                                    | 206 | REP..ML..   | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with left-hand thread  | 3.16                                    | 332 |
| RA..M..     | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with right-hand thread                                                                                                                                                                                                                                                                   | 3.16                                    | 332 | REP..MR..   | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with right-hand thread | 3.16                                    | 332 |
| RA..ML..    | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with left-hand thread                                                                                                                                                                                                                                                                    | 3.16                                    | 332 | R..F..      | Airframe rod ends – Internal thread self-lubricating spherical plain bearing rod end, NSA 8149 (inch dimensions)                                                                                  | 3.29                                    | 366 |
| RAP..M..    | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with right-hand thread                                                                                                                                                                                                                                                                   | 3.16                                    | 332 | R..F..      | For the bearing used in this rod end, see SW..                                                                                                                                                    |                                         |     |
| RAP..ML..   | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with left-hand thread                                                                                                                                                                                                                                                                    | 3.16                                    | 332 | RL..SP...   | For the cross-reference designation of this legacy product, see HMEN..                                                                                                                            |                                         |     |
| REP..       | Airframe rod ends – Internal thread rod end with integrated rolling bearing, AS 21153 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with right-hand thread                                                                                                                                                                                                                                                                   | 3.17                                    | 334 | R..M..      | Airframe rod ends – External thread self-lubricating spherical plain bearing rod end, NSA 8143 (inch dimensions)                                                                                  | 3.22                                    | 344 |
| REP..F..    | Airframe rod ends – Internal thread rod end with integrated rolling bearing, AS 21153 (inch dimensions), bearing in bearing steel and rod end body in cadmium plated steel with right-hand thread                                                                                                                                                                                                                                                                   | 3.17                                    | 334 | R..M..      | For the bearing used in this rod end, see SW..                                                                                                                                                    |                                         |     |
|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |     | SB5..       | Airframe rolling bearings – Deep groove ball bearing single row, AS 27646 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                 | 1.18                                    | 92  |
|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |     | SB55..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated bearing steel                                                                               | 1.19                                    | 96  |
|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |     | SC..M       | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in bearing steel and rod end body in zinc-nickel plated steel                   | 3.2                                     | 298 |
|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |     | SC..ME      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in bearing steel and rod end body in zinc-nickel plated steel                     | 3.2                                     | 298 |
|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |     | SC..MJ..    | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel                            | 3.1                                     | 296 |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                                | Product<br>table<br>No. Page <sup>1)</sup> | Designation  | Product                                                                                                                                                                                                                                                              | Product<br>table<br>No. Page <sup>1)</sup> |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| SCN...-..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in bearing steel and rod end body in zinc-nickel plated steel                          | 3.15 326                                   | SDSRP..      | Airframe rolling bearings – Spherical roller bearing single row (inch dimensions), zinc-nickel plated bearing steel                                                                                                                                                  | 1.27 116                                   |
| SCN..E..    | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in bearing steel and rod end body in zinc-nickel plated steel                            | 3.15 326                                   | SDW..        | Airframe rolling bearings – Deep groove ball bearing double row, AS 27647 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                                                                                    | 1.21 100                                   |
| SCN..JESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in bearing steel and rod end body in zinc-nickel plated steel with UNJF profile thread   | 3.14 322                                   | SDW..K       | Airframe rolling bearings – Deep groove ball bearing double row, AS 27647 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                                                                                    | 1.21 100                                   |
| SCN..JSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in bearing steel and rod end body in zinc-nickel plated steel with UNJF profile thread | 3.14 322                                   | SDW..K2      | Airframe rolling bearings – Deep groove ball bearing double row, AS 27647 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                                                                                    | 1.21 100                                   |
| SCN..M      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in bearing steel and rod end body in zinc-nickel plated steel                        | 3.2 298                                    | SEF..        | Airframe rod ends – Internal thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel inner ring and zinc-nickel plated steel rod end body                                                                     | 3.8 316                                    |
| SCN..ME     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in bearing steel and rod end body in zinc-nickel plated steel                          | 3.2 298                                    | SEFJ/NAS..   | Airframe rod ends – Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions), PH13.8 inner ring and zinc-nickel plated 4340 steel rod end body                                                                             | 3.27 358                                   |
| SCN..MESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in bearing steel and rod end body in zinc-nickel plated steel with UNF profile thread    | 3.14 322                                   | SEFJ/NAS..   | For the bearing used in this rod end, see NAS..                                                                                                                                                                                                                      |                                            |
| SCN..MESP1  | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in bearing steel and rod end body in zinc-nickel plated steel                          | 3.2 298                                    | SEFJ/QML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                    | 3.12 318                                   |
| SCN..MJ..   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel                                 | 3.1 296                                    | SEFJ/QML..   | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                      |                                            |
| SCN..MSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in bearing steel and rod end body in zinc-nickel plated steel with UNF profile thread  | 3.14 322                                   | SEFJ/QML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                   | 3.12 318                                   |
| SCN..MSP1   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in bearing steel and rod end body in zinc-nickel plated steel                        | 3.2 298                                    | SEFJ/QML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.34 378                                   |
| SDPP..      | Airframe rolling bearings – Deep groove ball bearing double row, AS 27644 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                      | 1.20 98                                    | SEFJ/QMLC..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                      |                                            |
| SDSP..      | Airframe rolling bearings – Self-aligning ball bearing double row, AS 27643 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                    | 1.26 114                                   | SEFJ/QMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.34 378                                   |
|             |                                                                                                                                                                                                        |                                            | SEFJ/QML..R  | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                      |                                            |

<sup>1)</sup> Starting page of the product table.



| Designation  | Product                                                                                                                                                                                                                                                                           | Product table No. | Page <sup>1)</sup> |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| SEFJ/QMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.34              | 378                |
| SEFJ/QMLS..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                   |                   |                    |
| SEFJ/QMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                    | 3.13              | 320                |
| SEFJ/QMT..   | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEFJ/QMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                   | 3.13              | 320                |
| SEFJ/QMT..   | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEFJ/QMTC..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.35              | 380                |
| SEFJ/QMTC..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEFJ/QMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.35              | 380                |
| SEFJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEFJ/QMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.35              | 380                |
| SEFJ/QMTS..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEFJ/RL..    | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                                  | 3.6               | 306                |
| SEFJ/RL..    | For the bearing used in this rod end, see WEN..                                                                                                                                                                                                                                   |                   |                    |
| SEFJ/RT..    | Airframe rod ends – Internal thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                     | 3.7               | 308                |

| Designation  | Product                                                                                                                                                                                                                                                                       | Product table No. | Page <sup>1)</sup> |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| SEFJ/RT..    | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                               |                   |                    |
| SEFJ/RT..R.. | Airframe rod ends – Internal thread inserted high-misalignment self-lubricating spherical plain bearing rod end (inch dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                   | 3.31              | 372                |
| SEFJ/RT..R.. | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                               |                   |                    |
| SEFJ/WAS..   | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), PH13.8 inner ring and zinc-nickel plated 4340 steel rod end body                                                                                        | 3.25              | 350                |
| SEFJ/WAS..   | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                               |                   |                    |
| SEFJ/WML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                    | 3.12              | 318                |
| SEFJ/WML..   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                   |                    |
| SEFJ/WML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                   | 3.12              | 318                |
| SEFJ/WML..   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                   |                    |
| SEFJ/WMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.34              | 378                |
| SEFJ/WMLC..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                   |                    |
| SEFJ/WML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.34              | 378                |
| SEFJ/WML..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                   |                    |
| SEFJ/WMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.34              | 378                |
| SEFJ/WMLS..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                   |                    |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                                                                                                                                                    | Product<br>table<br>No. Page <sup>1)</sup> | Designation   | Product                                                                                                                                                                                                                                                                           | Product<br>table<br>No. Page <sup>1)</sup> |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| SEFJ/WMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                    | 3.13 320                                   | SEFJ/WQMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body              | 3.34 378                                   |
| SEFJ/WMT..   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                            | SEFJ/WQMLC..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                            |
| SEFJ/WMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                   | 3.13 320                                   | SEFJ/WQML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove                        | 3.34 378                                   |
| SEFJ/WMT..   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                            | SEFJ/WQML..R  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                            |
| SEFJ/WMTC..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.35 380                                   | SEFJ/WQMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring                | 3.34 378                                   |
| SEFJ/WMTC..R | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                            | SEFJ/WQMLS..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                            |
| SEFJ/WMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.35 380                                   | SEFJ/WQMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                    | 3.13 320                                   |
| SEFJ/WMT..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                            | SEFJ/WQMT..   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                            |
| SEFJ/WMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.35 380                                   | SEFJ/WQMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                   | 3.13 320                                   |
| SEFJ/WMTS..R | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                            | SEFJ/WQMT..   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                            |
| SEFJ/WQML..  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                                          | 3.12 318                                   | SEFJ/WQMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body | 3.35 380                                   |
| SEFJ/WQML..  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                           |                                            | SEFJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                            |
| SEFJ/WQML..  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                                         | 3.12 318                                   | SEFJ/WQMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove           | 3.35 380                                   |
| SEFJ/WQML..  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                           |                                            | SEFJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                            |

<sup>1)</sup> Starting page of the product table.

| Designation   | Product                                                                                                                                                                                                                                                                         | Product table No. | Page <sup>1)</sup> | Designation  | Product                                                                                                                                                                                                                                                                           | Product table No. | Page <sup>1)</sup> |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| SEFJ/WQMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring | 3.35              | 380                | SEMJ/QMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.32              | 374                |
| SEFJ/WQMTS..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                |                   |                    | SEMJ/QMLS..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                   |                   |                    |
| SEM..         | Airframe rod ends – External thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel inner ring and zinc-nickel plated steel rod end body                                                                                | 3.8               | 310                | SEMJ/QMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                    | 3.10              | 314                |
| SEMA..        | Airframe rod ends – External thread inserted self-lubricating spherical plain bearing rod end (metric dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                                     | 3.3               | 300                | SEMJ/QMT..   | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEMA..        | For the bearing used in this rod end, see HMEN..R..                                                                                                                                                                                                                             |                   |                    | SEMJ/QMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                   | 3.10              | 314                |
| SEMJ/NAS..    | Airframe rod ends – External thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions), PH13.8 inner ring and zinc-nickel plated 4340 steel rod end body                                                                                        | 3.20              | 340                | SEMJ/QMT..   | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEMJ/NAS..    | For the bearing used in this rod end, see ENAS..                                                                                                                                                                                                                                |                   |                    | SEMJ/QMTC..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.33              | 376                |
| SEMJ/QML..    | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                               | 3.9               | 312                | SEMJ/QMTC..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEMJ/QML..    | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                 |                   |                    | SEMJ/QMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.33              | 376                |
| SEMJ/QML..    | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                              | 3.9               | 312                | SEMJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEMJ/QML..    | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                 |                   |                    | SEMJ/QMTS..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.33              | 376                |
| SEMJ/QMLC..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body            | 3.32              | 374                | SEMJ/QMTS..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                   |                   |                    |
| SEMJ/QMLC..R  | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                 |                   |                    | SEMJ/RL..    | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                                  | 3.4               | 302                |
| SEMJ/QML..R   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove                      | 3.32              | 374                | SEMJ/RL..    | For the bearing used in this rod end, see WEN..                                                                                                                                                                                                                                   |                   |                    |
| SEMJ/QML..R   | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                 |                   |                    | SEMJ/RL..R.. | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                                    | 3.23              | 346                |
|               |                                                                                                                                                                                                                                                                                 |                   |                    | SEMJ/RL..R.. | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                                   |                   |                    |

<sup>1)</sup> Starting page of the product table.



| Designation  | Product                                                                                                                                                                                                                                                                       | Product table<br>No. Page <sup>1)</sup> |     | Designation  | Product                                                                                                                                                                                                                                                                                    | Product table<br>No. Page <sup>1)</sup> |     |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| SEMJ/RT..    | Airframe rod ends – External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                 | 3.5                                     | 304 | SEMJ/WMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                    | 3.10                                    | 314 |
| SEMJ/RT..    | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                               |                                         |     | SEMJ/WMT..   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                         |     |
| SEMJ/RT..R.. | Airframe rod ends – External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (inch dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                   | 3.24                                    | 348 | SEMJ/WMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                   | 3.10                                    | 314 |
| SEMJ/RT..R.. | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                               |                                         |     | SEMJ/WMT..   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                         |     |
| SEMJ/WAS..   | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), PH13.8 inner ring and zinc-nickel plated 4340 steel rod end body                                                                                        | 3.18                                    | 336 | SEMJ/WMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.33                                    | 376 |
| SEMJ/WAS..   | For the bearing used in this rod end, see EWAS..                                                                                                                                                                                                                              |                                         |     | SEMJ/WMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.33                                    | 376 |
| SEMJ/WML..   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                    | 3.9                                     | 312 | SEMJ/WMT..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                         |     |
| SEMJ/WML..   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                                         |     | SEMJ/WMTS..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.33                                    | 376 |
| SEMJ/WML..   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                   | 3.9                                     | 312 | SEMJ/WMTS..R | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                            |                                         |     |
| SEMJ/WML..   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                                         |     | SEMJ/WQML..  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                                          | 3.9                                     | 312 |
| SEMJ/WMLC..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.32                                    | 374 | SEMJ/WQML..  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                           |                                         |     |
| SEMJ/WMLC..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                                         |     | SEMJ/WQML..  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                                         | 3.9                                     | 312 |
| SEMJ/WML..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.32                                    | 374 | SEMJ/WQML..  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                           |                                         |     |
| SEMJ/WML..R  | For the bearing used in this rod end, see ML..                                                                                                                                                                                                                                |                                         |     |              |                                                                                                                                                                                                                                                                                            |                                         |     |
| SEMJ/WMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.32                                    | 374 |              |                                                                                                                                                                                                                                                                                            |                                         |     |
| SEMJ/WMLS..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                               |                                         |     |              |                                                                                                                                                                                                                                                                                            |                                         |     |

<sup>1)</sup> Starting page of the product table.

| Designation   | Product                                                                                                                                                                                                                                                                           | Product table No. Page <sup>1)</sup> | Designation   | Product                                                                                                                                                                                                                                                                         | Product table No. Page <sup>1)</sup> |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| SEMJ/WQMLC..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body              | 3.32 374                             | SEMJ/WQMTS..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring | 3.33 376                             |
| SEMJ/WQMLC..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                      | SEMJ/WQMTS..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                |                                      |
| SEMJ/WQML..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove                        | 3.32 374                             | SFJ/NAS..     | Airframe rod ends – Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions), 440C inner ring and zinc-nickel plated 4340 steel rod end body                                                                                          | 3.27 358                             |
| SEMJ/WQML..R  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                      | SFJ/NAS..     | For the bearing used in this rod end, see NAS..                                                                                                                                                                                                                                 |                                      |
| SEMJ/WQMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring                | 3.32 374                             | SFJ/WAS..     | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), 440C inner ring and zinc-nickel plated 4340 steel rod end body                                                                                            | 3.25 350                             |
| SEMJ/WQMLS..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                      | SFJ/WAS..     | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                                 |                                      |
| SEMJ/WQMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                    | 3.10 314                             | SH..          | Airframe spherical plain bearings – Self-lubricating high misalignment (inch dimensions)                                                                                                                                                                                        | 2.31 256                             |
| SEMJ/WQMT..   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                      | ..SK          | Airframe self-lubricating journal bearings – Plain bearings, EN 2287, metric dimensions, corrosion-resistant-steel S.80, liner Fiberslip                                                                                                                                        | 4.1 404                              |
| SEMJ/WQMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                   | 3.10 314                             | SKP..         | Airframe rolling bearings – Deep groove ball bearing single row, AS 27640 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                                                                                               | 1.14 78                              |
| SEMJ/WQMT..   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                      | SKP..A        | Airframe rolling bearings – Deep groove ball bearing single row, AS 27641 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                                                                                               | 1.15 80                              |
| SEMJ/WQMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body | 3.33 376                             | SKP..APSP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, shielded                                                                                                                                                   | 1.17 90                              |
| SEMJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                      | SKP..ASP..    | Airframe rolling bearings – Deep groove ball bearing single row inch dimensions), zinc-nickel plated bearing steel, sealed                                                                                                                                                      | 1.17 90                              |
| SEMJ/WQMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), zinc-nickel plated steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove           | 3.33 376                             | SKP..B        | Airframe rolling bearings – Deep groove ball bearing single row, AS 27642 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                                                                                               | 1.16 84                              |
| SEMJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                      | SKP..BS       | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row, AS 27648 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                                                                       | 1.22 102                             |
| SEMJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                      | SKP..L        | Airframe rolling bearings – Deep groove ball bearing single row, AS 27640 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance                                                                                                                               | 1.14 78                              |
| SEMJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                      | SKP..LPSP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, shielded                                                                                                                                                   | 1.17 90                              |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                          | Product<br>table<br>No. Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                | Product<br>table<br>No. Page <sup>1)</sup> |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| SKP..LSP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, sealed                                      | 1.17 90                                    | SMDW..K2    | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision                         | 1.21 100                                   |
| SKP..PSP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, shielded                                    | 1.17 90                                    | SMJ/NAS..   | Airframe rod ends – External thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions), 440C inner ring and zinc-nickel plated 4340 steel rod end body | 3.20 340                                   |
| SKP..SP..    | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, sealed                                      | 1.17 90                                    | SMJ/NAS..   | For the bearing used in this rod end, see NAS..                                                                                                                                        |                                            |
| SKSP..       | Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance              | 1.23 106                                   | SMJ/WAS..   | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), 440C inner ring and zinc-nickel plated 4340 steel rod end body   | 3.18 336                                   |
| SKSP..A      | Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance              | 1.23 106                                   | SMJ/WAS..   | For the bearing used in this rod end, see WAS..                                                                                                                                        |                                            |
| SKSP..APSP.. | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, shielded                                  | 1.24 110                                   | SMKP..      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision                         | 1.14 78                                    |
| SKSP..ASP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, sealed                                    | 1.24 110                                   | SMKP..A     | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision                         | 1.15 80                                    |
| SKSP..L      | Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance              | 1.23 106                                   | SMKP..B     | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision                         | 1.16 84                                    |
| SKSP..PSP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, shielded                                  | 1.24 110                                   | SMKP..BS    | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision | 1.22 102                                   |
| SKSP..SP..   | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, sealed                                    | 1.24 110                                   | SMKP..L     | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision                         | 1.14 78                                    |
| SMB5..       | Airframe rolling bearings – Deep groove ball bearing single row, AS 21428 (inch dimensions), zinc-nickel plated bearing steel, reduced clearance and precision   | 1.18 92                                    | SMKSP..     | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision                       | 1.23 106                                   |
| SMDPP..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision   | 1.20 98                                    | SMKSP..A    | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision                       | 1.23 106                                   |
| SMDSP..      | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision | 1.26 114                                   | SMKSP..L    | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision                       | 1.23 106                                   |
| SMDW..       | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision   | 1.21 100                                   | SN..        | Airframe spherical plain bearings – Self-lubricating narrow, NSA 8134, NSA 8136 (inch dimensions)                                                                                      | 2.25 232                                   |
| SMDW..K      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated bearing steel, reduced tolerance and SKF super precision   | 1.21 100                                   | SN..ZT..    | Airframe spherical plain bearings – Self-lubricating narrow controlled clearance (inch dimensions)                                                                                     | 2.24 230                                   |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                               | Product table No. | Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                               | Product table No. | Page <sup>1)</sup> |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| SRA..M..    | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.16              | 332                | STRCE..     | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row, EN 3059 (metric dimensions), bearing steel bearing and zinc-nickel plated steel self-aligning ring           | 1.7               | 64                 |
| SRA..ML..   | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.16              | 332                | STRCEI..    | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (metric dimensions), zinc-nickel plated bearing steel bearing and zinc-nickel plated steel self-aligning ring | 1.8               | 56                 |
| SRAP..M..   | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.16              | 332                | SUFJ/XRE..  | For the cross-reference designation of this legacy product, see SFJ/NAS.., SEFJ/NAS..                                                                                                                 |                   |                    |
| SRAP..ML..  | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.16              | 332                | SUFJ/XRL..  | For the cross-reference designation of this legacy product, see SFJ/WAS.., SEFJ/WAS..                                                                                                                 |                   |                    |
| SREP..      | Airframe rod ends – Internal thread rod end with integrated rolling bearing, AS 21153 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.17              | 334                | SUMJ/XRE..  | For the cross-reference designation of this legacy product, see SMJ/NAS.., SEMJ/NAS..                                                                                                                 |                   |                    |
| SREP..F..   | Airframe rod ends – Internal thread rod end with integrated rolling bearing, AS 21153 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.17              | 334                | SUMJ/XRL..  | For the cross-reference designation of this legacy product, see SMJ/WAS.., SEMJ/WAS..                                                                                                                 |                   |                    |
| SREP..FL..  | Airframe rod ends – Internal thread rod end with integrated rolling bearing, AS 21153 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.17              | 334                | SW..        | Airframe spherical plain bearings – Self-lubricating wide, NSA 8135, NSA 8137 (inch dimensions)                                                                                                       | 2.28              | 244                |
| SREP..L..   | Airframe rod ends – Internal thread rod end with integrated rolling bearing, AS 21153 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.17              | 334                | SW..        | For rod ends using this bearing, see R..M.., R..F..                                                                                                                                                   |                   |                    |
| SREP..M..   | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.16              | 332                | SWATRCE..   | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (metric dimensions), corrosion-resistant-steel bearing and zinc-nickel plated steel self-aligning ring        | 1.7               | 64                 |
| SREP..ML..  | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.16              | 332                | SWATRCEI..  | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (metric dimensions), corrosion-resistant-steel bearing and zinc-nickel plated steel self-aligning ring        | 1.8               | 56                 |
| SREP..MR..  | Airframe rod ends – External thread rod end with integrated rolling bearing, AS 21151 (inch dimensions), bearing in bearing steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.16              | 332                | SWC..M      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel           | 3.2               | 298                |
|             |                                                                                                                                                                                                       |                   |                    | SWC..ME     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel             | 3.2               | 298                |
|             |                                                                                                                                                                                                       |                   |                    | SWC..MJ..   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel                    | 3.1               | 296                |
|             |                                                                                                                                                                                                       |                   |                    | SWCN..-..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel             | 3.15              | 326                |
|             |                                                                                                                                                                                                       |                   |                    | SWCN..E..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel               | 3.15              | 326                |

<sup>1)</sup> Starting page of the product table.

| Designation   | Product                                                                                                                                                                                                            | Product<br>table<br>No. Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                                 | Product<br>table<br>No. Page <sup>1)</sup> |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| SWCN...JESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with UNJF profile thread   | 3.14 322                                   | SWRA..M..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.16 332                                   |
| SWCN...JSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with UNJF profile thread | 3.14 322                                   | SWRA..ML..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.16 332                                   |
| SWCN...M      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel                        | 3.2 298                                    | SWRAP..M..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.16 332                                   |
| SWCN...ME     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel                          | 3.2 298                                    | SWRAP..ML.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.16 332                                   |
| SWCN...MESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with UNF profile thread    | 3.14 322                                   | SWREP..     | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.17 334                                   |
| SWCN...MESP1  | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel                          | 3.2 298                                    | SWREP..F..  | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.17 334                                   |
| SWCN...MJ..   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel                                 | 3.1 296                                    | SWREP..FL.. | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.17 334                                   |
| SWCN...MSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with UNF profile thread  | 3.14 322                                   | SWREP..L..  | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.17 334                                   |
| SWCN...MSP1   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel                        | 3.2 298                                    | SWREP..M..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.16 332                                   |
| SWEF..        | Airframe rod ends – Internal thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel inner ring and zinc-nickel plated steel rod end body                  | 3.8 316                                    | SWREP..ML.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with left-hand thread  | 3.16 332                                   |
| SWEM..        | Airframe rod ends – External thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel inner ring and zinc-nickel plated steel rod end body                  | 3.8 310                                    | SWREP..MR.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated steel with right-hand thread | 3.16 332                                   |
|               |                                                                                                                                                                                                                    |                                            | SZAG..      | Airframe rolling bearings – Deep groove ball bearing double row (metric dimensions), zinc-nickel plated bearing steel                                                                                   | 1.5 60                                     |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                    | Product table<br>No. Page <sup>1)</sup> |     | Designation | Product                                                                                                                                                                    | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| SZAGN..     | Airframe rolling bearings – Deep groove ball bearing double row, (metric dimensions), zinc-nickel plated bearing steel                                                                     | 1.6                                     | 62  | SZGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (inch dimensions), bearing steel inner ring and outer ring zinc-plated plated                          | 2.10                                    | 184 |
| SZENAS..    | Airframe spherical plain bearings – Self-lubricating narrow, AS 14101, AS 14104 (inch dimensions), PH13.8 inner ring and zinc-nickel plated outer ring                                     | 2.26                                    | 236 | SZHMEN..    | Airframe spherical plain bearings – Self-lubricating high-misalignment (metric dimensions), zinc-nickel plated                                                             | 2.21                                    | 224 |
| SZENAS..A.. | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/1, AS 81820/4 (inch dimensions), PH13.8 inner ring and zinc-nickel plated outer ring                                 | 2.27                                    | 240 | SZJN..      | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                      | 1.1                                     | 52  |
| SZENE..     | Airframe spherical plain bearings – Metal-to-metal swaged narrow (inch dimensions), zinc-nickel plated                                                                                     | 2.12                                    | 190 | SZJNA..     | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                      | 1.2                                     | 54  |
| SZENL..     | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), zinc-nickel plated                                                                                       | 2.14                                    | 198 | SZK..       | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                      | 1.11                                    | 72  |
| SZEWAS..    | Airframe spherical plain bearings – Self-lubricating narrow, AS 14102, AS 14103 (inch dimensions), PH13.8 inner ring and zinc-nickel plated outer ring                                     | 2.29                                    | 248 | SZK..D      | Airframe rolling bearings – Spherical roller bearing double row (metric dimensions), zinc-nickel plated bearing steel                                                      | 1.13                                    | 76  |
| SZEWAS..A.. | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/2, AS 81820/3 (inch dimensions), PH13.8 inner ring and zinc-nickel plated outer ring                                 | 2.30                                    | 252 | SZK..F      | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                      | 1.11                                    | 72  |
| SZGE..      | Airframe spherical plain bearings – Metal-to-metal loader slot (metric dimensions), bearing steel inner ring and outer ring zinc-plated plated                                             | 2.1                                     | 156 | SZKN..      | Airframe rolling bearings – Self-aligning ball bearing double row, (metric dimensions), zinc-nickel plated bearing steel                                                   | 1.9                                     | 68  |
| SZGL..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring zinc-plated plated                                      | 2.2                                     | 160 | SZKN..      | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), zinc-nickel plated bearing steel                                                      | 1.25                                    | 112 |
| SZGLD..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring zinc-plated plated                                      | 2.2                                     | 160 | SZKN..      | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                      | 1.11                                    | 72  |
| SZGLS..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring zinc-plated plated                                      | 2.2                                     | 160 | SZKNA..F    | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                      | 1.12                                    | 74  |
| SZGLS..MRTG | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), bearing steel inner ring and outer ring zinc-plated plated with molybdenum disulfide | 2.3                                     | 164 | SZKN..F     | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                      | 1.11                                    | 72  |
| SZGLS..RTG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), bearing steel inner ring and outer ring zinc-plated plated                           | 2.3                                     | 164 | SZKNRCE..   | Airframe rolling bearings – Self-aligning ball bearing double row (metric dimensions), zinc-nickel plated bearing steel                                                    | 1.10                                    | 70  |
| SZGLS..TAG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring zinc-plated plated                                      | 2.2                                     | 160 | SZLEN..     | Airframe spherical plain bearings – Self-lubricating light (metric dimensions), zinc-nickel plated                                                                         | 2.18                                    | 214 |
| SZGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (metric dimensions), bearing steel inner ring and outer ring zinc-plated plated                                        | 2.4                                     | 166 | SZMWKP..A   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision | 1.15                                    | 80  |
|             |                                                                                                                                                                                            |                                         |     | SZMWKP..B   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision | 1.16                                    | 84  |
|             |                                                                                                                                                                                            |                                         |     | SZNAS..     | Airframe spherical plain bearings – Self-lubricating narrow, AS 14101, AS 14104 (inch dimensions), 440C inner ring and zinc-nickel plated outer ring                       | 2.26                                    | 236 |

<sup>1)</sup> Starting page of the product table.



| Designation  | Product                                                                                                                                                                                                                 | Product table No. | Page <sup>1)</sup> | Designation  | Product                                                                                                                                                                                                       | Product table No. | Page <sup>1)</sup> |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| SZNAS..A..   | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/1, AS 81820/4 (inch dimensions), 440C inner ring and zinc-nickel plated outer ring                                                                | 2.27              | 240                | SZQMA..      | Airframe spherical plain bearings – Metal-to-metal swaged light (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                                  | 2.5               | 168                |
| SZNEN..      | Airframe spherical plain bearings – Self-lubricating narrow (metric dimensions), zinc-nickel plated                                                                                                                     | 2.19              | 216                | SZQME..      | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                                 | 2.6               | 172                |
| SZQ2PL..     | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                                            | 2.9               | 182                | SZQME..      | Airframe spherical plain bearings – Metal-to-metal swaged narrow (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                                   | 2.11              | 186                |
| SZQ2PL..     | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                                              | 2.17              | 210                | SZQML..      | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                                   | 2.7               | 176                |
| SZQGE..      | Airframe spherical plain bearings – Metal-to-metal loader slot (metric dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated                                             | 2.1               | 156                | SZQML..      | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                                     | 2.13              | 194                |
| SZQGL..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated                                      | 2.2               | 160                | SZQMT..      | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                      | 2.8               | 180                |
| SZQGLD..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated                                      | 2.2               | 160                | SZQMT..      | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-nickel plated                        | 2.15              | 202                |
| SZQGLS..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated                                      | 2.2               | 160                | SZQXMB..     | Airframe spherical plain bearings – Metal-to-metal swaged (inch dimensions), zinc-nickel plated                                                                                                               | 2.16              | 206                |
| SZQGLS..MRTG | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated with molybdenum disulfide | 2.3               | 164                | SZRL..SP.... | For the cross-reference designation of this legacy product, see SZHMEN..                                                                                                                                      |                   |                    |
| SZQGLS..RTG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated                           | 2.3               | 164                | SZT..        | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                                                         | 1.3               | 56                 |
| SZQGLS..TAG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated                                      | 2.2               | 160                | SZTA..       | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated bearing steel                                                                                         | 1.4               | 58                 |
| SZQGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (metric dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated                                        | 2.4               | 166                | SZTRCE..     | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row EN 3060 (metric dimensions), zinc-nickel plated bearing steel bearing and zinc-nickel plated steel self-aligning ring | 1.7               | 64                 |
| SZQGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (inch dimensions), plated bronze beryllium inner ring and corrosion-resistant-steel outer ring zinc-plated                                          | 2.10              | 184                | SZW2PL..     | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                                                   | 2.9               | 182                |
|              |                                                                                                                                                                                                                         |                   |                    | SZW2PL..     | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                                                     | 2.17              | 210                |
|              |                                                                                                                                                                                                                         |                   |                    | SZWAG..      | Airframe rolling bearings – Deep groove ball bearing double row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                             | 1.5               | 60                 |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                           | Product table<br>No. Page <sup>1)</sup> |     | Designation  | Product                                                                                                                                                                                                | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| SZWAGN..    | Airframe rolling bearings – Deep groove ball bearing double row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                 | 1.6                                     | 62  | SZWGLD..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated                                      | 2.2                                     | 160 |
| SZWAS..     | Airframe spherical plain bearings – Self-lubricating narrow, AS 14102, AS 14103 (inch dimensions), 440C inner ring and zinc-nickel plated outer ring              | 2.29                                    | 248 | SZWGLS..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated                                      | 2.2                                     | 160 |
| SZWAS..A..  | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/2, AS 81820/3 (inch dimensions), 440C inner ring and zinc-nickel plated outer ring          | 2.30                                    | 252 | SZWGLS..MRTG | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated with molybdenum disulfide | 2.3                                     | 164 |
| SZWATA..    | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                 | 1.4                                     | 58  | SZWGLS..RTG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated                           | 2.3                                     | 164 |
| SZWB5..     | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance               | 1.18                                    | 92  | SZWGLS..TAG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated                                      | 2.2                                     | 160 |
| SZWB55..    | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel                                   | 1.19                                    | 96  | SZWGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (metric dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated                                        | 2.4                                     | 166 |
| SZWDPP..    | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance               | 1.20                                    | 98  | SZWGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (inch dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated                                          | 2.10                                    | 184 |
| SZWDSP..    | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance             | 1.26                                    | 114 | SZWJN..      | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                      | 1.1                                     | 52  |
| SZWDSP..    | Airframe rolling bearings – Spherical roller bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel                                   | 1.27                                    | 116 | SZWJNA..     | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                      | 1.2                                     | 54  |
| SZWDW..     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance               | 1.21                                    | 100 | SZWK..       | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                      | 1.11                                    | 72  |
| SZWDW..K    | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance               | 1.21                                    | 100 | SZWK..D      | Airframe rolling bearings – Spherical roller bearing double row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                      | 1.13                                    | 76  |
| SZWDW..K2   | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance               | 1.21                                    | 100 | SZWK..F      | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                      | 1.11                                    | 72  |
| SZWEN..     | Airframe spherical plain bearings – Self-lubricating wide (metric dimensions), zinc-nickel plated                                                                 | 2.20                                    | 220 | SZWKN..      | Airframe rolling bearings – Self-aligning ball bearing double row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                    | 1.9                                     | 68  |
| SZWGE..     | Airframe spherical plain bearings – Metal-to-metal loader slot (metric dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated        | 2.1                                     | 156 | SZWKN..      | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel                                                                          | 1.25                                    | 112 |
| SZWGL..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), plated corrosion-resistant-steel inner ring and outer ring zinc-plated | 2.2                                     | 160 | SZWKN..      | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                      | 1.11                                    | 72  |

<sup>1)</sup> Starting page of the product table.



| Designation   | Product                                                                                                                                                                     | Product<br>table<br>No. Page <sup>1)</sup> | Designation    | Product                                                                                                                                                                      | Product<br>table<br>No. Page <sup>1)</sup> |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| SZWKNA..F     | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                           | 1.12 74                                    | SZWKSP..A      | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance                        | 1.23 106                                   |
| SZWKN..F      | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                           | 1.11 72                                    | SZWKSP..APSP.. | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, shielded                                  | 1.24 110                                   |
| SZWKNRCE..    | Airframe rolling bearings – Self-aligning ball bearing double row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                         | 1.10 70                                    | SZWKSP..ASP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, sealed                                    | 1.24 110                                   |
| SZWKP..       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance                         | 1.14 78                                    | SZWKSP..L      | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance                        | 1.23 106                                   |
| SZWKP..A      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance                         | 1.15 80                                    | SZWKSP..PSP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, shielded                                  | 1.24 110                                   |
| SZWKP..APSP.. | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, shielded                                       | 1.17 90                                    | SZWKSP..SP..   | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, sealed                                    | 1.24 110                                   |
| SZWKP..ASP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, sealed                                         | 1.17 90                                    | SZWMA..        | Airframe spherical plain bearings – Metal-to-metal swaged light (metric dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                  | 2.5 168                                    |
| SZWKP..B      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance                         | 1.16 84                                    | SZWMB5..       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced clearance and precision             | 1.18 92                                    |
| SZWKP..BS     | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance | 1.22 102                                   | SZWMDPP..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision   | 1.20 98                                    |
| SZWKP..L      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance                         | 1.14 78                                    | SZWMDSP..      | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision | 1.26 114                                   |
| SZWKP..LPSP.. | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, shielded                                       | 1.17 90                                    | SZWMDW..       | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision   | 1.21 100                                   |
| SZWKP..LSP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, sealed                                         | 1.17 90                                    | SZWMDW..K      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision   | 1.21 100                                   |
| SZWKP..PSP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, shielded                                       | 1.17 90                                    | SZWMDW..K2     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision   | 1.21 100                                   |
| SZWKP..SP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, sealed                                         | 1.17 90                                    |                |                                                                                                                                                                              |                                            |
| SZWKSP..      | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, standard tolerance                       | 1.23 106                                   |                |                                                                                                                                                                              |                                            |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                            | Product table No. | Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                                         | Product table No. | Page <sup>1)</sup> |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| SZWME..     | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                                       | 2.6               | 172                | SZWQ2PL..   | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                                    | 2.9               | 182                |
| SZWME..     | Airframe spherical plain bearings – Metal-to-metal swaged narrow, AS 21154, AS 21155 (inch dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                     | 2.11              | 186                | SZWQ2PL..   | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                                      | 2.17              | 210                |
| SZWMKP..    | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.14              | 78                 | SZWQMA..    | Airframe spherical plain bearings – Metal-to-metal swaged light (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                                    | 2.5               | 168                |
| SZWMKP..BS  | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision | 1.22              | 102                | SZWQME..    | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                                   | 2.6               | 172                |
| SZWMKP..L   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.14              | 78                 | SZWQME..    | Airframe spherical plain bearings – Metal-to-metal swaged narrow, AS 21154, AS 21155 (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                 | 2.11              | 186                |
| SZWMKSP..   | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23              | 106                | SZWQML..    | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                                     | 2.7               | 176                |
| SZWMKSP..A  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23              | 106                | SZWQML..    | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                                       | 2.13              | 194                |
| SZWMKSP..L  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23              | 106                | SZWQMT..    | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                        | 2.8               | 180                |
| SZWML..     | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                                         | 2.7               | 176                | SZWQMT..    | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring zinc-nickel plated                          | 2.15              | 202                |
| SZWML..     | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                                           | 2.13              | 194                | SZWT..      | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel                                                                               | 1.3               | 56                 |
| SZWMT..     | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                            | 2.8               | 180                | SZXC..M     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel | 3.2               | 298                |
| SZWMT..     | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), corrosion-resistant-steel inner ring and outer ring zinc-nickel plated                              | 2.15              | 202                |             |                                                                                                                                                                                                                 |                   |                    |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                                                                                                | Product table<br>No. Page <sup>1)</sup> |     | Designation  | Product                                                                                                                                                                                                                                                       | Product table<br>No. Page <sup>1)</sup> |     |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| SZXC..ME     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                          | 3.2                                     | 298 | SZXC..MSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel with UNF profile thread                         | 3.14                                    | 322 |
| SZXC..MJ..   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                                 | 3.1                                     | 296 | SZXC..MSP1   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                                               | 3.2                                     | 298 |
| SZXC..-..    | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                          | 3.15                                    | 326 | SZXRA..      | For the cross-reference designation of this legacy product, see SZLEN..                                                                                                                                                                                       |                                         |     |
| SZXC..E..    | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                            | 3.15                                    | 326 | SZXRE..      | For the cross-reference designation of this legacy product, see SZNEN.., SZNAS..                                                                                                                                                                              |                                         |     |
| SZXC..JESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel with UNJF profile thread   | 3.14                                    | 322 | SZXRE..A..   | For the cross-reference designation of this legacy product, see SZNAS..A..                                                                                                                                                                                    |                                         |     |
| SZXC..JSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel with UNJF profile thread | 3.14                                    | 322 | SZXRL..      | For the cross-reference designation of this legacy product, see SZWEN.., SZWAS..                                                                                                                                                                              |                                         |     |
| SZXC..M      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                        | 3.2                                     | 298 | SZXRL..A..   | For the cross-reference designation of this legacy product, see SZWAS..A..                                                                                                                                                                                    |                                         |     |
| SZXC..ME     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                          | 3.2                                     | 298 | SZXRL..FR..  | Airframe spherical plain bearings – Self-lubricating pre-staked (metric dimensions), zinc-nickel plated                                                                                                                                                       | 2.23                                    | 228 |
| SZXC..MESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel with UNF profile thread    | 3.14                                    | 322 | SZXRT..      | Airframe spherical plain bearings – Self-lubricating high-misalignment (metric dimensions), zinc-nickel plated                                                                                                                                                | 2.22                                    | 226 |
| SZXC..MESP1  | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                          | 3.2                                     | 298 | SZXRT..      | Airframe spherical plain bearings – Self-lubricating high-misalignment (inch dimensions), zinc-nickel plated                                                                                                                                                  | 2.33                                    | 260 |
| SZXC..MJ..   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in corrosion-resistant-steel and rod end body in zinc-nickel plated corrosion-resistant-steel                                 | 3.1                                     | 296 | T..          | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), not plated bearing steel                                                                                                                                                 | 1.3                                     | 56  |
|              |                                                                                                                                                                                                                                        |                                         |     | TA..         | Airframe rolling bearings – Deep groove ball bearing single row, EN 3281 (metric dimensions), not plated bearing steel                                                                                                                                        | 1.4                                     | 58  |
|              |                                                                                                                                                                                                                                        |                                         |     | TEFJ/QML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                    | 3.12                                    | 318 |
|              |                                                                                                                                                                                                                                        |                                         |     | TEFJ/QML..   | For the bearing used in this rod end, see QML..                                                                                                                                                                                                               |                                         |     |
|              |                                                                                                                                                                                                                                        |                                         |     | TEFJ/QMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.34                                    | 378 |
|              |                                                                                                                                                                                                                                        |                                         |     | TEFJ/QMLC..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                               |                                         |     |
|              |                                                                                                                                                                                                                                        |                                         |     | TEFJ/QML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.34                                    | 378 |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                                                                                                                                                                                    | Product table No. | Page <sup>1)</sup> |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| TEFJ/QML..R  | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                                                            |                   |                    |
| TEFJ/QMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring For the bearing used in this rod end, see QML..                | 3.34              | 378                |
| TEFJ/QMLS..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                                                            |                   |                    |
| TEFJ/QMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring For the bearing used in this rod end, see QMT..                                    | 3.13              | 320                |
| TEFJ/QMT..   | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                                                            |                   |                    |
| TEFJ/QMTC..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body For the bearing used in this rod end, see QMT.. | 3.35              | 380                |
| TEFJ/QMTC..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                                                            |                   |                    |
| TEFJ/QMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove For the bearing used in this rod end, see QMT..           | 3.35              | 380                |
| TEFJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                                                            |                   |                    |
| TEFJ/QMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring For the bearing used in this rod end, see QMT..   | 3.35              | 380                |
| TEFJ/QMTS..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                                                            |                   |                    |
| TEFJ/RL..    | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions), anodized titanium rod end For the bearing used in this rod end, see WEN..                                                                                                                          | 3.6               | 306                |
| TEFJ/RL..    | For the bearing used in this rod end, see WEN..                                                                                                                                                                                                                                                                            |                   |                    |
| TEFJ/RL..R.. | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), anodized titanium rod end For the bearing used in this rod end, see WAS..                                                                                                                            | 3.30              | 370                |
| TEFJ/RL..R.. | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                                                                            |                   |                    |
| TEFJ/RT..    | Airframe rod ends – Internal thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions), anodized titanium rod end                                                                                                                                                             | 3.7               | 308                |

| Designation  | Product                                                                                                                                                                                                                                                                                                                             | Product table No. | Page <sup>1)</sup> |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| TEFJ/RT..    | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                                                                                     |                   |                    |
| TEFJ/RT..R.. | Airframe rod ends – Internal thread inserted high-misalignment self-lubricating spherical plain bearing rod end (inch dimensions), anodized titanium rod end For the bearing used in this rod end, see XRT..                                                                                                                        | 3.31              | 372                |
| TEFJ/RT..R.. | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                                                                                     |                   |                    |
| TEFJ/WML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring For the bearing used in this rod end, see WML..                                                 | 3.12              | 318                |
| TEFJ/WML..   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                                                                     |                   |                    |
| TEFJ/WMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body For the bearing used in this rod end, see WML..              | 3.34              | 378                |
| TEFJ/WMLC..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                                                                     |                   |                    |
| TEFJ/WML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove For the bearing used in this rod end, see WML..                        | 3.34              | 378                |
| TEFJ/WML..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                                                                     |                   |                    |
| TEFJ/WMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring For the bearing used in this rod end, see WML..                | 3.34              | 378                |
| TEFJ/WMLS..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                                                                     |                   |                    |
| TEFJ/WMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring For the bearing used in this rod end, see WMT..                                    | 3.13              | 320                |
| TEFJ/WMT..   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                                                                     |                   |                    |
| TEFJ/WMTC..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body For the bearing used in this rod end, see WMT.. | 3.35              | 380                |
| TEFJ/WMTC..R | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                                                                     |                   |                    |

<sup>1)</sup> Starting page of the product table.

| Designation   | Product                                                                                                                                                                                                                                                                           | Product table No. Page <sup>1)</sup> | Designation   | Product                                                                                                                                                                                                                                                                    | Product table No. Page <sup>1)</sup> |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| TEFJ/WMT..R   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove         | 3.35 380                             | TEFJ/WQMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body | 3.35 380                             |
| TEFJ/WMT..R   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                   |                                      | TEFJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                           |                                      |
| TEFJ/WMTS..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring | 3.35 380                             | TEFJ/WQMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove           | 3.35 380                             |
| TEFJ/WMTS..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                   |                                      | TEFJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                           |                                      |
| TEFJ/WQML..   | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                                        | 3.12 318                             | TEFJ/WQMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring   | 3.35 380                             |
| TEFJ/WQML..   | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                      | TEFJ/WQMTS..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                           |                                      |
| TEFJ/WQMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body                     | 3.34 378                             | TEMA..        | Airframe rod ends – External thread inserted self-lubricating spherical plain bearing rod end (metric dimensions), anodized titanium rod end                                                                                                                               | 3.3 300                              |
| TEFJ/WQMLC..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                      | TEMA..        | For the bearing used in this rod end, see HMEN..R..                                                                                                                                                                                                                        |                                      |
| TEFJ/WQML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove                               | 3.34 378                             | TEMJ/QML..    | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                                 | 3.9 312                              |
| TEFJ/WQML..R  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                      | TEMJ/QML..    | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                            |                                      |
| TEFJ/WQMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring                       | 3.34 378                             | TEMJ/QMLC..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body              | 3.32 374                             |
| TEFJ/WQMLS..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                      | TEMJ/QMLC..R  | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                            |                                      |
| TEFJ/WQMT..   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                           | 3.13 320                             | TEMJ/QML..R   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove                        | 3.32 374                             |
| TEFJ/WQMT..   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                      | TEMJ/QML..R   | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                            |                                      |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                                                                                                                                    | Product table No. | Page <sup>1)</sup> |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| TEMJ/QMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.32              | 374                |
| TEMJ/QMLS..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                            |                   |                    |
| TEMJ/QMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring                                    | 3.10              | 314                |
| TEMJ/QMT..   | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                            |                   |                    |
| TEMJ/QMTC..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.33              | 300                |
| TEMJ/QMTC..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                            |                   |                    |
| TEMJ/QMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.33              | 300                |
| TEMJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                            |                   |                    |
| TEMJ/QMTS..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.33              | 300                |
| TEMJ/QMTS..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                            |                   |                    |
| TEMJ/RL..    | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions), anodized titanium rod end                                                                                                                          | 3.4               | 302                |
| TEMJ/RL..    | For the bearing used in this rod end, see WEN..                                                                                                                                                                                                                            |                   |                    |
| TEMJ/RL..R.. | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), anodized titanium rod end                                                                                                                            | 3.23              | 346                |
| TEMJ/RL..R.. | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                            |                   |                    |
| TEMJ/RT..    | Airframe rod ends – External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions), anodized titanium rod end                                                                                                             | 3.5               | 346                |
| TEMJ/RT..    | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                            |                   |                    |

| Designation  | Product                                                                                                                                                                                                                                                                             | Product table No. | Page <sup>1)</sup> |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| TEMJ/RT..R.. | Airframe rod ends – External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (inch dimensions), anodized titanium rod end                                                                                                                        | 3.24              | 348                |
| TEMJ/RT..R.. | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                                     |                   |                    |
| TEMJ/WML..   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                                 | 3.9               | 312                |
| TEMJ/WML..   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                     |                   |                    |
| TEMJ/WMLC..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body              | 3.32              | 374                |
| TEMJ/WMLC..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                     |                   |                    |
| TEMJ/WML..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove                        | 3.32              | 374                |
| TEMJ/WML..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                     |                   |                    |
| TEMJ/WML..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.32              | 374                |
| TEMJ/WML..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                     |                   |                    |
| TEMJ/WML..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring                                    | 3.10              | 314                |
| TEMJ/WMT..   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                     |                   |                    |
| TEMJ/WMTC..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.33              | 300                |
| TEMJ/WMTC..R | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                     |                   |                    |

<sup>1)</sup> Starting page of the product table.



| Designation   | Product                                                                                                                                                                                                                                                                           | Product<br>table<br>No. Page <sup>1)</sup> | Designation   | Product                                                                                                                                                                                                                                                                    | Product<br>table<br>No. Page <sup>1)</sup> |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| TEMJ/WMT..R   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove         | 3.33 300                                   | TEMJ/WQMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body | 3.33 300                                   |
| TEMJ/WMT..R   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                   |                                            | TEMJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                           |                                            |
| TEMJ/WMTS..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring | 3.33 300                                   | TEMJ/WQMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove           | 3.33 300                                   |
| TEMJ/WMTS..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                   |                                            | TEMJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                           |                                            |
| TEMJ/WQML..   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                                        | 3.9 312                                    | TEMJ/WQMTS..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring   | 3.33 300                                   |
| TEMJ/WQML..   | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                            | TEMJ/WQMTS..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                           |                                            |
| TEMJ/WQMLC..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body                     | 3.32 374                                   | TRCE..        | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row, EN 3059 (metric dimensions), bearing steel bearing and cadmium plated steel self-aligning ring                                                                                    | 1.7 64                                     |
| TEMJ/WQMLC..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                            | TRCEI..       | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row, EN 4041 (metric dimensions), cadmium plated bearing steel bearing and cadmium plated steel self-aligning ring                                                                     | 1.8 56                                     |
| TEMJ/WQML..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove                               | 3.32 374                                   | UFJ/XRE..     | For the cross-reference designation of this legacy product, see FJ/NAS.., EFJ/NAS..                                                                                                                                                                                        |                                            |
| TEMJ/WQML..R  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                            | UFJ/XRL..     | For the cross-reference designation of this legacy product, see FJ/WAS.., EFJ/WAS..                                                                                                                                                                                        |                                            |
| TEMJ/WQMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring                       | 3.32 374                                   | UMJ/XRE..     | For the cross-reference designation of this legacy product, see MJ/NAS.., EMJ/NAS..                                                                                                                                                                                        |                                            |
| TEMJ/WQMLS..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                  |                                            | UMJ/XRL..     | For the cross-reference designation of this legacy product, see MJ/WAS.., EMJ/WAS..                                                                                                                                                                                        |                                            |
| TEMJ/WQMT..   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (metric dimensions), anodized titanium rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring                                           | 3.10 314                                   | W2PL..        | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                                                                                                        | 2.9 258                                    |
| TEMJ/WQMT..   | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                  |                                            | W2PL..        | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                                                                                                          | 2.17 210                                   |
|               |                                                                                                                                                                                                                                                                                   |                                            | WAG..         | Airframe rolling bearings – Deep groove ball bearing double row (metric dimensions), not plated corrosion-resistant-steel                                                                                                                                                  | 1.5 60                                     |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                                                                  | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| WAGN..      | Airframe rolling bearings – Deep groove ball bearing double row, EN 3058 (metric dimensions), not plated corrosion-resistant-steel                                                                                                       | 1.6                                     | 62  |
| WAS..       | Airframe spherical plain bearings – Self-lubricating narrow, AS 14102, AS 14103 (inch dimensions), 440C inner ring and not plated outer ring                                                                                             | 2.29                                    | 248 |
| WAS..       | For rod ends using this bearing, see MJ/WAS..., SMJ/WAS..., PHMJ/WAS..., FJ/WAS..., SFJ/WAS..., PHFJ/WAS..., EMJ/RL...R..., SEMJ/RL...R..., XEMJ/RL...R..., TEMJ/RL...R..., EFJ/RL...R..., SEFJ/RL...R..., XEFJ/RL...R..., TEFJ/RL...R.. |                                         |     |
| WAS..A..    | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/2, AS 81820/3 (inch dimensions), 440C inner ring and not plated outer ring                                                                                         | 2.30                                    | 252 |
| WATA..      | Airframe rolling bearings – Deep groove ball bearing single row, EN 3283, EN 4033 (metric dimensions), not plated corrosion-resistant-steel                                                                                              | 1.4                                     | 58  |
| WATRCE..    | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (metric dimensions), corrosion-resistant-steel bearing and cadmium plated steel self-aligning ring                                               | 1.7                                     | 64  |
| WATRCEI..   | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (metric dimensions), corrosion-resistant-steel bearing and cadmium plated steel self-aligning ring                                               | 1.8                                     | 56  |
| WB5..       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, standard tolerance                                                                                                         | 1.18                                    | 92  |
| WB55..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel                                                                                                                             | 1.19                                    | 96  |
| WC..M       | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                                                  | 3.2                                     | 298 |
| WC..ME      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                                                    | 3.2                                     | 298 |
| WC..MJ..    | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                                                           | 3.1                                     | 296 |
| WCN...-     | Airframe rod ends – External thread rod end with integrated rolling bearing, EN 4157 (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                                           | 3.15                                    | 326 |
| WCN..E..    | Airframe rod ends – External thread rod end with integrated rolling bearing EN 4157 (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                                              | 3.15                                    | 326 |

| Designation | Product                                                                                                                                                                                                        | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| WCN..JESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with UNJF profile thread   | 3.14                                    | 322 |
| WCN..JSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with UNJF profile thread | 3.14                                    | 322 |
| WCN..M      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                        | 3.2                                     | 298 |
| WCN..ME     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                          | 3.2                                     | 298 |
| WCN..MESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with UNF profile thread    | 3.14                                    | 322 |
| WCN..MESP1  | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                          | 3.2                                     | 298 |
| WCN..MJ..   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                                 | 3.1                                     | 296 |
| WCN..MSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with UNF profile thread  | 3.14                                    | 322 |
| WCN..MSP1   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated steel                        | 3.2                                     | 298 |
| WDPP..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel, standard tolerance                                                                               | 1.20                                    | 98  |
| WDSP..      | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), corrosion-resistant-steel, standard tolerance                                                                             | 1.26                                    | 114 |
| WDSRP..     | Airframe rolling bearings – Spherical roller bearing single row (inch dimensions), corrosion-resistant-steel                                                                                                   | 1.27                                    | 116 |
| WDW..       | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel, standard tolerance                                                                               | 1.21                                    | 100 |
| WDW..K      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel, standard tolerance                                                                               | 1.21                                    | 100 |

<sup>1)</sup> Starting page of the product table.



| Designation | Product                                                                                                                                                                                        | Product table No. | Page <sup>1)</sup> | Designation | Product                                                                                                                                     | Product table No. | Page <sup>1)</sup> |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| WDW..K2     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel, standard tolerance                                                               | 1.21              | 100                | WJN..       | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), not plated corrosion-resistant-steel                   | 1.1               | 52                 |
| WEF..       | Airframe rod ends – Internal thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel inner ring and cadmium plated steel rod end body  | 3.8               | 316                | WJNA..      | Airframe rolling bearings – Deep groove ball bearing single row, EN 3286, EN 3047 (metric dimensions), not plated corrosion-resistant-steel | 1.2               | 54                 |
| WEM..       | Airframe rod ends – External thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel inner ring and cadmium plated steel rod end body  | 3.8               | 310                | WK..        | Airframe rolling bearings – Spherical roller bearing single row, EN 3055 (metric dimensions), not plated corrosion-resistant-steel          | 1.11              | 72                 |
| WEN..       | Airframe spherical plain bearings – Self-lubricating wide, EN 2585, EN 4039 (metric dimensions), not plated                                                                                    | 2.20              | 220                | WK..D       | Airframe rolling bearings – Spherical roller bearing double row (metric dimensions), not plated corrosion-resistant-steel                   | 1.13              | 76                 |
| WEN..       | For rod ends using this bearing, see EMJ/RL.., SEMJ/RL.., XEMJ/RL.., TEMJ/RL.., EFJ/RL.., SEFJ/RL.., XEFJ/RL.., TEFJ/RL..                                                                      |                   |                    | WK..F       | Airframe rolling bearings – Spherical roller bearing single row, EN 3055 (metric dimensions), not plated corrosion-resistant-steel          | 1.11              | 72                 |
| WGE..       | Airframe spherical plain bearings – Metal-to-metal loader slot, EN 2588 (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                    | 2.1               | 156                | WKN..       | Airframe rolling bearings – Self-aligning ball bearing double row, EN 3289 (metric dimensions), not plated corrosion-resistant-steel        | 1.9               | 68                 |
| WGL..       | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                      | 2.2               | 160                | WKN..       | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), not plated corrosion-resistant-steel                   | 1.25              | 112                |
| WGLD..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                      | 2.2               | 160                | WKN..       | Airframe rolling bearings – Spherical roller bearing single row, EN 3055 (metric dimensions), not plated corrosion-resistant-steel          | 1.11              | 72                 |
| WGLS..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                      | 2.2               | 160                | WKNA..F     | Airframe rolling bearings – Spherical roller bearing single row, EN 3292 (metric dimensions), not plated corrosion-resistant-steel          | 1.12              | 74                 |
| WGLS..MRTG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated with molybdenum disulfide | 2.3               | 164                | WKN..F      | Airframe rolling bearings – Spherical roller bearing single row, EN 3055 (metric dimensions), not plated corrosion-resistant-steel          | 1.11              | 72                 |
| WGLS..RTG   | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                           | 2.3               | 164                | WKNRCE..    | Airframe rolling bearings – Self-aligning ball bearing double row, EN 4034 (metric dimensions), not plated corrosion-resistant-steel        | 1.10              | 70                 |
| WGLS..TAG   | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                      | 2.2               | 160                | WKP..       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, standard tolerance            | 1.14              | 78                 |
| WGT..       | Airframe spherical plain bearings – Metal-to-metal loader slot wide (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                        | 2.4               | 166                | WKP..A      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, standard tolerance            | 1.15              | 80                 |
| WGT..       | Airframe spherical plain bearings – Metal-to-metal loader slot wide (inch dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                          | 2.10              | 184                | WKP..APSP.. | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, shielded                      | 1.17              | 90                 |
|             |                                                                                                                                                                                                |                   |                    | WKP..ASP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, sealed                        | 1.17              | 90                 |
|             |                                                                                                                                                                                                |                   |                    | WKP..B      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, standard tolerance            | 1.16              | 84                 |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                      | Product<br>table<br>No. Page <sup>1)</sup> |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| WKP..BS      | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (inch dimensions), corrosion-resistant-steel, standard tolerance     | 1.22 102                                   |
| WKP..L       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, standard tolerance                             | 1.14 78                                    |
| WKP..LPSP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, shielded                                       | 1.17 90                                    |
| WKP..LSP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, sealed                                         | 1.17 90                                    |
| WKP..PSP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, shielded                                       | 1.17 90                                    |
| WKP..SP..    | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, sealed                                         | 1.17 90                                    |
| WKSP..       | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, standard tolerance                           | 1.23 106                                   |
| WKSP..A      | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, standard tolerance                           | 1.23 106                                   |
| WKSP..APSP.. | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, shielded                                     | 1.24 110                                   |
| WKSP..ASP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, sealed                                       | 1.24 110                                   |
| WKSP..L      | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, standard tolerance                           | 1.23 106                                   |
| WKSP..PSP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, shielded                                     | 1.24 110                                   |
| WKSP..SP..   | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, sealed                                       | 1.24 110                                   |
| WMA..        | Airframe spherical plain bearings – Metal-to-metal swaged light, EN 2335 (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated | 2.5 168                                    |
| WMB5..       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, reduced clearance and precision                | 1.18 92                                    |
| WMDPP..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision      | 1.20 98                                    |

| Designation | Product                                                                                                                                                                         | Product<br>table<br>No. Page <sup>1)</sup> |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| WMDSP..     | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.26 114                                   |
| WMDW..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.21 100                                   |
| WMDW..K     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.21 100                                   |
| WMDW..K2    | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.21 100                                   |
| WME..       | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                            | 2.6 172                                    |
| WME..       | Airframe spherical plain bearings – Metal-to-metal swaged narrow (inch dimensions), corrosion-resistant-steel inner ring and outer ring not plated                              | 2.11 186                                   |
| WMKP..      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.14 78                                    |
| WMKP..A     | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.15 80                                    |
| WMKP..B     | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.16 84                                    |
| WMKP..BS    | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision | 1.22 102                                   |
| WMKP..L     | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.14 78                                    |
| WMKSP..     | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23 106                                   |
| WMKSP..A    | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23 106                                   |
| WMKSP..L    | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23 106                                   |

<sup>1)</sup> Starting page of the product table.

| <b>Designation</b> | <b>Product</b>                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Product<br/>table<br/>No.</b> | <b>Page<sup>1)</sup></b> | <b>Designation</b> | <b>Product</b>                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Product<br/>table<br/>No.</b> | <b>Page<sup>1)</sup></b> |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------|
| <b>WML..</b>       | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                                                                                                                                                                                                                                                            | 2.7                              | <b>176</b>               | <b>WQME..</b>      | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                                      | 2.6                              | <b>172</b>               |
| <b>WML..</b>       | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                                                                                                                                                                                                                                                              | 2.13                             | <b>194</b>               | <b>WQME..</b>      | Airframe spherical plain bearings – Metal-to-metal swaged narrow (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                                        | 2.11                             | <b>186</b>               |
| <b>WML..</b>       | For rod ends using this bearing, see EMJ/WML..., SEMJ/WML..., TEMJ/WML..., EFJ/WML..., SEFJ/WML..., TEFJ/WML..., EMJ/WML...R, SEMJ/WML...R, TEMJ/WML...R, EFJ/WML...R, SEFJ/WML...R, TEFJ/WML...R, EMJ/WMLS..R, SEMJ/WMLS..R, XEMJ/WMLS..R, TEMJ/WMLS..R, EFJ/WMLS..R, SEFJ/WMLS..R, XEFJ/WMLS..R, TEFJ/WMLS..R, EMJ/WMLC..R, SEMJ/WMLC..R, XEMJ/WMLC..R, TEMJ/WMLC..R, EFJ/WMLC..R, SEFJ/WMLC..R, XEFJ/WMLC..R, TEFJ/WMLC..R |                                  |                          | <b>WQML..</b>      | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                                        | 2.7                              | <b>176</b>               |
| <b>WMT..</b>       | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                                                                                                                                                                                                                                               | 2.8                              | <b>180</b>               | <b>WQML..</b>      | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                                          | 2.13                             | <b>194</b>               |
| <b>WMT..</b>       | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), corrosion-resistant-steel inner ring and outer ring not plated                                                                                                                                                                                                                                                                 | 2.15                             | <b>202</b>               | <b>WQML..</b>      | For rod ends using this bearing, see EMJ/WQML..., SEMJ/WQML..., TEMJ/WQML..., EFJ/WQML..., SEFJ/WQML..., TEFJ/WQML..., EMJ/WQML...R, SEMJ/WQML...R, TEMJ/WQML...R, EFJ/WQML...R, SEFJ/WQML...R, TEFJ/WQML...R, EMJ/WQMLS..R, SEMJ/WQMLS..R, XEMJ/WQMLS..R, TEMJ/WQMLS..R, EFJ/WQMLS..R, SEFJ/WQMLS..R, XEFJ/WQMLS..R, EMJ/WQMLC..R, SEMJ/WQMLC..R, XEMJ/WQMLC..R, TEMJ/WQMLC..R, EFJ/WQMLC..R, SEFJ/WQMLC..R, XEFJ/WQMLC..R, TEFJ/WQMLC..R |                                  |                          |
| <b>WMT..</b>       | For rod ends using this bearing, see EMJ/WMT..., SEMJ/WMT..., TEMJ/WMT..., EFJ/WMT..., SEFJ/WMT..., TEFJ/WMT..., EMJ/WMT...R, SEMJ/WMT...R, TEMJ/WMT...R, EFJ/WMT...R, SEFJ/WMT...R, TEFJ/WMT...R, EMJ/WMTS..R, SEMJ/WMTS..R, XEMJ/WMTS..R, TEMJ/WMTS..R, EFJ/WMTS..R, SEFJ/WMTS..R, XEFJ/WMTS..R, TEFJ/WMTS..R, EMJ/WMTC..R, SEMJ/WMTC..R, XEMJ/WMTC..R, TEMJ/WMTC..R, EFJ/WMTC..R, SEFJ/WMTC..R, XEFJ/WMTC..R, TEFJ/WMTC..R |                                  |                          | <b>WQMT..</b>      | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                           | 2.8                              | <b>180</b>               |
| <b>WQ2PL..</b>     | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                          | 2.9                              | <b>182</b>               | <b>WQMT..</b>      | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                             | 2.15                             | <b>202</b>               |
| <b>WQ2PL..</b>     | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                            | 2.17                             | <b>210</b>               | <b>WQMT..</b>      | For rod ends using this bearing, see EMJ/WQMT..., SEMJ/WQMT..., TEMJ/WQMT..., EFJ/WQMT..., SEFJ/WQMT..., TEFJ/WQMT..., EMJ/WQMT...R, SEMJ/WQMT...R, TEMJ/WQMT...R, EFJ/WQMT...R, SEFJ/WQMT...R, TEFJ/WQMT...R, EMJ/WQMTC..R, SEMJ/WQMTC..R, XEMJ/WQMTC..R, TEMJ/WQMTC..R, EFJ/WQMTC..R, SEFJ/WQMTC..R, XEFJ/WQMTC..R, TEFJ/WQMTC..R                                                                                                        |                                  |                          |
| <b>WQMA..</b>      | Airframe spherical plain bearings – Metal-to-metal swaged light (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring not plated                                                                                                                                                                                                                                                          | 2.5                              | <b>168</b>               |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |                          |

1) Starting page of the product table.

| Designation | Product                                                                                                                                                                                             | Product<br>table<br>No. Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                                             | Product<br>table<br>No. Page <sup>1)</sup> |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| WRA..M..    | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with right-hand thread | 3.16 332                                   | WZGE..      | Airframe spherical plain bearings – Metal-to-metal loader slot (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                                              | 2.1 156                                    |
| WRA..ML..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with left-hand thread  | 3.16 332                                   | WZK..F      | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                                       | 1.11 72                                    |
| WRAP..M..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with right-hand thread | 3.16 332                                   | XC..M       | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                        | 3.2 298                                    |
| WRAP..ML..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with left-hand thread  | 3.16 332                                   | XC..ME      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                          | 3.2 298                                    |
| WREP..      | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with right-hand thread | 3.17 334                                   | XC..MJ..    | Airframe rod ends – External thread rod end with integrated rolling bearing, EN 4036 (metric dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                        | 3.1 296                                    |
| WREP..F..   | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with right-hand thread | 3.17 334                                   | XCN..-..    | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                          | 3.15 326                                   |
| WREP..FL..  | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with left-hand thread  | 3.17 334                                   | XCN..E..    | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                            | 3.15 326                                   |
| WREP..L..   | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with left-hand thread  | 3.17 334                                   | XCN..JESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with UNJF profile thread   | 3.14 322                                   |
| WREP..M..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with right-hand thread | 3.16 332                                   | XCN..JSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with UNJF profile thread | 3.14 322                                   |
| WREP..ML..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with left-hand thread  | 3.16 332                                   | XCN..M      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                        | 3.2 298                                    |
| WREP..MR..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated steel with right-hand thread | 3.16 332                                   | XCN..ME     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                          | 3.2 298                                    |
| WT..        | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), not plated corrosion-resistant-steel                                                                           | 1.3 56                                     | XCN..MESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with UNF profile thread    | 3.14 322                                   |
|             |                                                                                                                                                                                                     |                                            | XCN..MESP1  | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                          | 3.2 298                                    |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                                                                                                                                          | Product table No. | Page <sup>1)</sup> | Designation  | Product                                                                                                                                                                                                                                                                          | Product table No. | Page <sup>1)</sup> |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| XCN..MJ..    | Airframe rod ends – External thread rod end with integrated rolling bearing, EN 4036 (metric dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                                                                                     | 3.1               | 296                | XEFJ/QMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring | 3.35              | 380                |
| XCN..MSP..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with UNF profile thread                                                               | 3.14              | 322                | XEFJ/QMTS..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                  |                   |                    |
| XCN..MSP1    | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel                                                                                     | 3.2               | 298                | XEFJ/RL..    | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                                           | 3.6               | 306                |
| XEF..        | Airframe rod ends – Internal thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel inner ring and corrosion-resistant-steel rod end body                                                                               | 3.8               | 316                | XEFJ/RL..    | For the bearing used in this rod end, see WEN..                                                                                                                                                                                                                                  |                   |                    |
| XEFJ/QMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body            | 3.34              | 378                | XEFJ/RL..R.. | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), zinc-nickel plated 30NCD16 steel rod end                                                                                                                   | 3.30              | 370                |
| XEFJ/QMLC..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                  |                   |                    | XEFJ/RL..R.. | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                                  |                   |                    |
| XEFJ/QML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove                      | 3.34              | 378                | XEFJ/RL..R.. | Airframe rod ends – Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                                             | 3.30              | 370                |
| XEFJ/QML..R  | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                  |                   |                    | XEFJ/RL..R.. | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                                  |                   |                    |
| XEFJ/QMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring              | 3.34              | 378                | XEFJ/RT..    | Airframe rod ends – Internal thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                              | 3.7               | 308                |
| XEFJ/QMLS..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                  |                   |                    | XEFJ/RT..    | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                                  |                   |                    |
| XEFJ/QMTC..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring | 3.35              | 380                | XEFJ/RT..R.. | Airframe rod ends – Internal thread inserted high-misalignment self-lubricating spherical plain bearing rod end (inch dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                                | 3.31              | 372                |
| XEFJ/QMTC..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                  |                   |                    | XEFJ/RT..R.. | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                                  |                   |                    |
| XEFJ/QMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove         | 3.35              | 380                | XEFJ/WMLC..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body   | 3.34              | 378                |
| XEFJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                  |                   |                    | XEFJ/WMLC..R | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                  |                   |                    |
| XEFJ/QMT..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove             | 3.34              | 378                | XEFJ/WML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove             | 3.34              | 378                |
| XEFJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                  |                   |                    | XEFJ/WML..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                  |                   |                    |

<sup>1)</sup> Starting page of the product table.

| Designation   | Product                                                                                                                                                                                                                                                                                     | Product table No. | Page <sup>1)</sup> |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| XEFJ/WMLS..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.34              | 378                |
| XEFJ/WMLS..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                             |                   |                    |
| XEFJ/WMTC..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.35              | 380                |
| XEFJ/WMTC..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                             |                   |                    |
| XEFJ/WMT..R   | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.35              | 380                |
| XEFJ/WMT..R   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                             |                   |                    |
| XEFJ/WMTS..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.35              | 380                |
| XEFJ/WMTS..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                             |                   |                    |
| XEFJ/WMTS..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body                       | 3.34              | 378                |
| XEFJ/WQMLC..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                            |                   |                    |
| XEFJ/WQML..R  | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove                                 | 3.34              | 378                |
| XEFJ/WQML..R  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                            |                   |                    |
| XEFJ/WQMLS..R | Airframe rod ends – Internal thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring                         | 3.34              | 378                |
| XEFJ/WQMLS..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                            |                   |                    |

| Designation   | Product                                                                                                                                                                                                                                                                            | Product table No. | Page <sup>1)</sup> |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| XEFJ/WQMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body | 3.35              | 380                |
| XEFJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                   |                   |                    |
| XEFJ/WQMT..R  | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove           | 3.35              | 380                |
| XEFJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                   |                   |                    |
| XEFJ/WQMTS..R | Airframe rod ends – Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring   | 3.35              | 380                |
| XEFJ/WQMTS..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                   |                   |                    |
| XEM..         | Airframe rod ends – External thread integrated metal-to-metal spherical plain bearing rod end (metric dimensions), corrosion-resistant-steel inner ring and corrosion-resistant-steel rod end body                                                                                 | 3.8               | 310                |
| XEMA..        | Airframe rod ends – External thread inserted self-lubricating spherical plain bearing rod end, EN 4198 (metric dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                                         | 3.3               | 370                |
| XEMA..        | For the bearing used in this rod end, see HMEN..R..                                                                                                                                                                                                                                |                   |                    |
| XEMJ/QMLC..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body              | 3.32              | 374                |
| XEMJ/QMLC..R  | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                    |                   |                    |
| XEMJ/QML..R   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove                        | 3.32              | 374                |
| XEMJ/QML..R   | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                    |                   |                    |
| XEMJ/QMLS..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.32              | 374                |

<sup>1)</sup> Starting page of the product table.



| Designation  | Product                                                                                                                                                                                                                                                                            | Product table<br>No. Page <sup>1)</sup> | Designation   | Product                                                                                                                                                                                                                                                                                     | Product table<br>No. Page <sup>1)</sup> |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| XEMJ/QMLS..R | For the bearing used in this rod end, see QML..                                                                                                                                                                                                                                    |                                         | XEMJ/WMLC..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                             |                                         |
| XEMJ/QMTC..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.33 300                                | XEMJ/WML..R   | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove                        | 3.32 374                                |
| XEMJ/QMTC..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                    |                                         | XEMJ/WML..R   | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                             |                                         |
| XEMJ/QMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.33 300                                | XEMJ/WMLS..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring                | 3.32 374                                |
| XEMJ/QMT..R  | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                    |                                         | XEMJ/WMLS..R  | For the bearing used in this rod end, see WML..                                                                                                                                                                                                                                             |                                         |
| XEMJ/QMTS..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, bronze beryllium inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.33 300                                | XEMJ/WMTC..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body | 3.33 300                                |
| XEMJ/QMTS..R | For the bearing used in this rod end, see QMT..                                                                                                                                                                                                                                    |                                         | XEMJ/WMTC..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                             |                                         |
| XEMJ/RL..    | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (metric dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                                             | 3.4 302                                 | XEMJ/WMT..R   | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring without lubrication groove           | 3.33 300                                |
| XEMJ/RL..    | For the bearing used in this rod end, see WEN..                                                                                                                                                                                                                                    |                                         | XEMJ/WMT..R   | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                             |                                         |
| XEMJ/RL..R.. | Airframe rod ends – External thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                                               | 3.23 310                                | XEMJ/WMTS..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the inner ring   | 3.33 300                                |
| XEMJ/RL..R.. | For the bearing used in this rod end, see WAS..                                                                                                                                                                                                                                    |                                         | XEMJ/WMTS..R  | For the bearing used in this rod end, see WMT..                                                                                                                                                                                                                                             |                                         |
| XEMJ/RT..    | Airframe rod ends – External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (metric dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                                | 3.5 346                                 | XEMJ/WQMLC..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body                       | 3.32 374                                |
| XEMJ/RT..    | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                                    |                                         | XEMJ/WQMLC..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                            |                                         |
| XEMJ/RT..R.. | Airframe rod ends – External thread inserted high-misalignment self-lubricating spherical plain bearing rod end (inch dimensions), 17-4PH H1025 corrosion-resistant-steel rod end                                                                                                  | 3.24 348                                | XEMJ/WQML..R  | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove                                 | 3.32 374                                |
| XEMJ/RT..R.. | For the bearing used in this rod end, see XRT..                                                                                                                                                                                                                                    |                                         |               |                                                                                                                                                                                                                                                                                             |                                         |
| XEMJ/WMLC..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and corrosion-resistant-steel outer ring with lubrication by the rod end body     | 3.32 374                                |               |                                                                                                                                                                                                                                                                                             |                                         |

<sup>1)</sup> Starting page of the product table.

| Designation   | Product                                                                                                                                                                                                                                                                            | Product table<br>No. Page <sup>1)</sup> | Designation | Product                                                                                                                                                                                                                                 | Product table<br>No. Page <sup>1)</sup> |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| XEMJ/WQML..R  | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                   |                                         | XRE..       | For the cross-reference designation of this legacy product, see NEN.., NAS..                                                                                                                                                            |                                         |
| XEMJ/WQMLS..R | Airframe rod ends – External thread inserted wide metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring                | 3.32 374                                | XRE..A..    | For the cross-reference designation of this legacy product, see NAS..A..                                                                                                                                                                |                                         |
| XEMJ/WQMLS..R | For the bearing used in this rod end, see WQML..                                                                                                                                                                                                                                   |                                         | XREP..      | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with right-hand thread                                | 3.17 334                                |
| XEMJ/WQMTC..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the rod end body | 3.33 300                                | XREP..F..   | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with right-hand thread                                | 3.17 334                                |
| XEMJ/WQMTC..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                   |                                         | XREP..FL..  | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with left-hand thread                                 | 3.17 334                                |
| XEMJ/WQMT..R  | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring without lubrication groove           | 3.33 300                                | XREP..L..   | Airframe rod ends – Internal thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with left-hand thread                                 | 3.16 332                                |
| XEMJ/WQMT..R  | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                   |                                         | XREP..M..   | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with right-hand thread                                | 3.16 332                                |
| XEMJ/WQMTS..R | Airframe rod ends – External thread inserted high misalignment metal-to-metal spherical plain bearing rod end (inch dimensions), corrosion-resistant-steel rod end body, corrosion-resistant-steel inner ring and bronze aluminium outer ring with lubrication by the inner ring   | 3.33 300                                | XREP..ML..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with left-hand thread                                 | 3.16 332                                |
| XEMJ/WQMTS..R | For the bearing used in this rod end, see WQMT..                                                                                                                                                                                                                                   |                                         | XREP..MR..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with right-hand thread                                | 2.23 228                                |
| XRA..         | For the cross-reference designation of this legacy product, see LEN..                                                                                                                                                                                                              |                                         | XRL..       | For the cross-reference designation of this legacy product, see WEN.., WAS..                                                                                                                                                            |                                         |
| XRA..M..      | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with right-hand thread                                                                           | 3.16 332                                | XRL..A..    | For the cross-reference designation of this legacy product, see WAS..A..                                                                                                                                                                |                                         |
| XRA..ML..     | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with left-hand thread                                                                            | 3.16 332                                | XRL..FR..   | Airframe spherical plain bearings – Self-lubricating pre-staked (metric dimensions), not plated                                                                                                                                         | 2.22 226                                |
| XRAP..M..     | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with right-hand thread                                                                           | 3.16 332                                | XRT..       | Airframe spherical plain bearings – Self-lubricating high-misalignment (metric dimensions), not plated                                                                                                                                  | 2.33 260                                |
| XRAP..ML..    | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), bearing in corrosion-resistant-steel and rod end body in corrosion-resistant-steel with left-hand thread                                                                            | 3.16 322                                | XRT..       | Airframe spherical plain bearings – Self-lubricating high-misalignment (inch dimensions), not plated                                                                                                                                    |                                         |
|               |                                                                                                                                                                                                                                                                                    |                                         | XRT..       | For rod ends using this bearing, see EMJ/RT.., SEMJ/RT.., XEMJ/RT.., TEMJ/RT.., EFJ/RT.., SEFJ/RT.., XEFJ/RT.., TEFJ/RT.., EMJ/RT..R.., SEMJ/RT..R.., XEMJ/RT..R.., TEMJ/RT..R.., EFJ/RT..R.., SEFJ/RT..R.., XEFJ/RT..R.., TEFJ/RT..R.. |                                         |

<sup>1)</sup> Starting page of the product table.



| Designation | Product                                                                                                                                                                                                  | Product table<br>No. Page <sup>1)</sup> |     | Designation | Product                                                                                                                                                                                | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| XTRCE..     | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row, EN 3061 (metric dimensions), corrosion-resistant-steel bearing and corrosion-resistant-steel self-aligning ring | 1.7                                     | 64  | ZGLS..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring cadmium plated                                      | 2.2                                     | 160 |
| XTRCEI..    | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row, EN 4041 (metric dimensions), corrosion-resistant-steel bearing and corrosion-resistant-steel self-aligning ring | 1.8                                     | 56  | ZGLS..MRTG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), bearing steel inner ring and outer ring cadmium plated with molybdenum disulfide | 2.3                                     | 164 |
| ZAG..       | Airframe rolling bearings – Deep groove ball bearing double row (metric dimensions), cadmium plated bearing steel                                                                                        | 1.5                                     | 60  | ZGLS..RTG   | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), bearing steel inner ring and outer ring cadmium plated                           | 2.3                                     | 164 |
| ZAGN..      | Airframe rolling bearings – Deep groove ball bearing double row, EN 3057 (metric dimensions), cadmium plated bearing steel                                                                               | 1.6                                     | 62  | ZGLS..TAG   | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring cadmium plated                                      | 2.2                                     | 160 |
| ZENAS..     | Airframe spherical plain bearings – Self-lubricating narrow, AS 14101, AS 14104 (inch dimensions), PH13.8 inner ring and cadmium plated outer ring                                                       | 2.26                                    | 236 | ZGT..       | Airframe spherical plain bearings – Metal-to-metal loader slot wide (metric dimensions), bearing steel inner ring and outer ring cadmium plated                                        | 2.4                                     | 166 |
| ZENAS..A..  | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/1, AS 81820/4 (inch dimensions), PH13.8 inner ring and cadmium plated outer ring                                                   | 2.27                                    | 240 | ZGT..       | Airframe spherical plain bearings – Metal-to-metal loader slot wide (inch dimensions), bearing steel inner ring and outer ring cadmium plated                                          | 2.10                                    | 184 |
| ZENE..      | Airframe spherical plain bearings – Metal-to-metal swaged narrow, EN 6046 (inch dimensions), cadmium plated                                                                                              | 2.12                                    | 190 | ZHMEN..     | Airframe spherical plain bearings – Self-lubricating high-misalignment (metric dimensions), cadmium plated                                                                             | 2.21                                    | 224 |
| ZENL..      | Airframe spherical plain bearings – Metal-to-metal swaged wide, EN 4266 (inch dimensions), cadmium plated                                                                                                | 2.14                                    | 198 | ZJN..       | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), cadmium plated bearing steel                                                                      | 1.1                                     | 52  |
| ZEWAS..     | Airframe spherical plain bearings – Self-lubricating narrow, AS 14102, AS 14103 (inch dimensions), PH13.8 inner ring and cadmium plated outer ring                                                       | 2.29                                    | 248 | ZJNA..      | Airframe rolling bearings – Deep groove ball bearing single row, EN 3285, EN 3046 (metric dimensions), cadmium plated bearing steel                                                    | 1.2                                     | 54  |
| ZEWAS..     | For rod ends using this bearing, see EMJ/WAS..., SEMJ/WAS..., EPHMJ/WAS..., EFJ/WAS..., SEFJ/WAS..., PHFJ/WAS..                                                                                          |                                         |     | ZK..        | Airframe rolling bearings – Spherical roller bearing single row, EN 3054 (metric dimensions), cadmium plated bearing steel                                                             | 1.11                                    | 72  |
| ZEWAS..A..  | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/2, AS 81820/3 (inch dimensions), PH13.8 inner ring and cadmium plated outer ring                                                   | 2.30                                    | 252 | ZK..D       | Airframe rolling bearings – Spherical roller bearing double row (metric dimensions), cadmium plated bearing steel                                                                      | 1.13                                    | 76  |
| ZGE..       | Airframe spherical plain bearings – Metal-to-metal loader slot (metric dimensions), bearing steel inner ring and outer ring cadmium plated                                                               | 2.1                                     | 156 | ZK..F       | Airframe rolling bearings – Spherical roller bearing single row, EN 3054 (metric dimensions), cadmium plated bearing steel                                                             | 1.11                                    | 72  |
| ZGL..       | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring cadmium plated                                                        | 2.2                                     | 160 | ZKN..       | Airframe rolling bearings – Self-aligning ball bearing double row, EN 3288 (metric dimensions), cadmium plated bearing steel                                                           | 1.9                                     | 68  |
| ZGLD..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bearing steel inner ring and outer ring cadmium plated                                                        | 2.2                                     | 160 | ZKN..       | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), cadmium plated bearing steel                                                                      | 1.25                                    | 112 |
|             |                                                                                                                                                                                                          |                                         |     | ZKN..       | Airframe rolling bearings – Spherical roller bearing single row, EN 3054 (metric dimensions), cadmium plated bearing steel                                                             | 1.11                                    | 72  |
|             |                                                                                                                                                                                                          |                                         |     | ZKNA..F     | Airframe rolling bearings – Spherical roller bearing single row, EN 3291 (metric dimensions), cadmium plated bearing steel                                                             | 1.12                                    | 74  |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                                             | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| ZKN..F      | Airframe rolling bearings – Spherical roller bearing single row, EN 3054 (metric dimensions), cadmium plated bearing steel                                                                                          | 1.11                                    | 72  |
| ZKNRCE..    | Airframe rolling bearings – Self-aligning ball bearing double row (metric dimensions), cadmium plated bearing steel                                                                                                 | 1.10                                    | 70  |
| ZLEN..      | Airframe spherical plain bearings – Self-lubricating light (metric dimensions), cadmium plated                                                                                                                      | 2.18                                    | 214 |
| ZNAS..      | Airframe spherical plain bearings – Self-lubricating narrow, AS 14101, AS 14104 (inch dimensions), 440C inner ring and cadmium plated outer ring                                                                    | 2.26                                    | 236 |
| ZNAS..A..   | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/1, AS 81820/4 (inch dimensions), 440C inner ring and cadmium plated outer ring                                                                | 2.27                                    | 240 |
| ZNEN..      | Airframe spherical plain bearings – Self-lubricating narrow (metric dimensions), cadmium plated                                                                                                                     | 2.19                                    | 216 |
| ZQ2PL..     | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated                                            | 2.9                                     | 182 |
| ZQ2PL..     | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated                                              | 2.17                                    | 210 |
| ZQGE..      | Airframe spherical plain bearings – Metal-to-metal loader slot (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated                                             | 2.1                                     | 156 |
| ZQGL..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated                                      | 2.2                                     | 160 |
| ZQGLD..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated                                      | 2.2                                     | 160 |
| ZQGLS..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated                                      | 2.2                                     | 160 |
| ZQGLS..MRTG | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated with molybdenum disulfide | 2.3                                     | 164 |
| ZQGLS..RTG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated                           | 2.3                                     | 164 |

| Designation | Product                                                                                                                                                                              | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| ZQGLS..TAG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated       | 2.2                                     | 160 |
| ZQGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated         | 2.4                                     | 166 |
| ZQGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated           | 2.10                                    | 184 |
| ZQMA..      | Airframe spherical plain bearings – Metal-to-metal swaged light (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated             | 2.5                                     | 168 |
| ZQME..      | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated            | 2.6                                     | 172 |
| ZQME..      | Airframe spherical plain bearings – Metal-to-metal swaged narrow (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated              | 2.11                                    | 186 |
| ZQML..      | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated              | 2.7                                     | 176 |
| ZQML..      | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated                | 2.13                                    | 194 |
| ZQMT..      | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated | 2.8                                     | 180 |
| ZQMT..      | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), bronze beryllium inner ring and corrosion-resistant-steel outer ring cadmium plated   | 2.15                                    | 202 |
| ZQXMB..     | Airframe spherical plain bearings – Metal-to-metal swaged (inch dimensions), cadmium plated                                                                                          | 2.16                                    | 206 |
| ZRL..SP.... | For the cross-reference designation of this legacy product, see ZHMEN..                                                                                                              |                                         |     |
| ZT..        | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), cadmium plated bearing steel                                                                    | 1.3                                     | 56  |
| ZTA..       | Airframe rolling bearings – Deep groove ball bearing single row, EN 3282 (metric dimensions), cadmium plated bearing steel                                                           | 1.4                                     | 58  |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                               | Product table<br>No. Page <sup>1)</sup> |     | Designation | Product                                                                                                                                                                                            | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| ZTRCE..     | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row EN 3060 (metric dimensions), cadmium plated bearing steel bearing and cadmium plated steel self-aligning ring | 1.7                                     | 64  | ZWDW..K2    | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                                                    | 1.21                                    | 100 |
| ZW2PL..     | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                               | 2.9                                     | 182 | ZWEN..      | Airframe spherical plain bearings – Self-lubricating wide (metric dimensions), cadmium plated                                                                                                      | 2.20                                    | 220 |
| ZW2PL..     | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                                 | 2.17                                    | 210 | ZWGL..      | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                      | 2.2                                     | 160 |
| ZWAG..      | Airframe rolling bearings – Deep groove ball bearing double row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                         | 1.5                                     | 60  | ZWGLD..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                      | 2.2                                     | 160 |
| ZWAGN..     | Airframe rolling bearings – Deep groove ball bearing double row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                         | 1.6                                     | 62  | ZWGLS..     | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                      | 2.2                                     | 160 |
| ZWAS..      | Airframe spherical plain bearings – Self-lubricating narrow, AS 14102, AS 14103 (inch dimensions), 440C inner ring and cadmium plated outer ring                                                      | 2.29                                    | 248 | ZWGLS..MRTG | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated with molybdenum disulfide | 2.3                                     | 164 |
| ZWAS..A..   | Airframe spherical plain bearings – Self-lubricating narrow, AS 81820/2, AS 81820/3 (inch dimensions), 440C inner ring and cadmium plated outer ring                                                  | 2.30                                    | 252 | ZWGLS..RTG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal reinforced (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                           | 2.3                                     | 164 |
| ZWATA..     | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                         | 1.4                                     | 58  | ZWGLS..TAG  | Airframe spherical plain bearings – Metal-to-metal loader slot normal (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                      | 2.2                                     | 160 |
| ZWB5..      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                                                       | 1.18                                    | 92  | ZWGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                        | 2.4                                     | 166 |
| ZWB55..     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel                                                                           | 1.19                                    | 96  | ZWGT..      | Airframe spherical plain bearings – Metal-to-metal loader slot wide (inch dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                          | 2.10                                    | 184 |
| ZWDPP..     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                                                       | 1.20                                    | 98  | ZWJN..      | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                      | 1.1                                     | 52  |
| ZWDSP..     | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                                                     | 1.26                                    | 114 | ZWJNA..     | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                      | 1.2                                     | 54  |
| ZWDSRP..    | Airframe rolling bearings – Spherical roller bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel                                                                           | 1.27                                    | 116 | ZWK..       | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                      | 1.11                                    | 72  |
| ZWDW..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                                                       | 1.21                                    | 100 | ZWK..D      | Airframe rolling bearings – Spherical roller bearing double row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                      | 1.13                                    | 76  |
| ZWDW..K     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                                                       | 1.21                                    | 100 | ZWKN..      | Airframe rolling bearings – Self-aligning ball bearing double row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                    | 1.9                                     | 68  |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                                 | Product table<br>No. Page <sup>1)</sup> |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| ZWKN..       | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), zinc-nickel plated corrosion-resistant-steel                                       | 1.25 <b>112</b>                         |
| ZWKN..       | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                           | 1.11 <b>72</b>                          |
| ZWKNA..F     | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                           | 1.12 <b>74</b>                          |
| ZWKN..F      | Airframe rolling bearings – Spherical roller bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                           | 1.11 <b>72</b>                          |
| ZWKNRCE..    | Airframe rolling bearings – Self-aligning ball bearing double row (metric dimensions), cadmium plated corrosion-resistant-steel                                         | 1.10 <b>70</b>                          |
| ZWKP..       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                         | 1.14 <b>78</b>                          |
| ZWKP..A      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                         | 1.15 <b>80</b>                          |
| ZWKP..APSP.. | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, shielded                                   | 1.17 <b>90</b>                          |
| ZWKP..ASP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, sealed                                     | 1.17 <b>90</b>                          |
| ZWKP..B      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                         | 1.16 <b>84</b>                          |
| ZWKP..BS     | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance | 1.22 <b>102</b>                         |
| ZWKP..L      | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                         | 1.14 <b>78</b>                          |
| ZWKP..LPSP.. | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, shielded                                   | 1.17 <b>90</b>                          |
| ZWKP..LSP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, sealed                                     | 1.17 <b>90</b>                          |
| ZWKP..PSP..  | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, shielded                                   | 1.17 <b>90</b>                          |
| ZWKP..SP..   | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, sealed                                     | 1.17 <b>90</b>                          |

| Designation   | Product                                                                                                                                                                  | Product table<br>No. Page <sup>1)</sup> |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| ZWKSP..       | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                        | 1.23 <b>106</b>                         |
| ZWKSP..A      | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                        | 1.23 <b>106</b>                         |
| ZWKSP..APSP.. | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, shielded                                  | 1.24 <b>110</b>                         |
| ZWKSP..ASP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, sealed                                    | 1.24 <b>110</b>                         |
| ZWKSP..L      | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, standard tolerance                        | 1.23 <b>106</b>                         |
| ZWKSP..PSP..  | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, shielded                                  | 1.24 <b>110</b>                         |
| ZWKSP..SP..   | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, sealed                                    | 1.24 <b>110</b>                         |
| ZWMA..        | Airframe spherical plain bearings – Metal-to-metal swaged light (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                  | 2.5 <b>168</b>                          |
| ZWMB5..       | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced clearance and precision             | 1.18 <b>92</b>                          |
| ZWMDPP..      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision   | 1.20 <b>98</b>                          |
| ZWMDSP..      | Airframe rolling bearings – Self-aligning ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision | 1.26 <b>114</b>                         |
| ZWMDW..       | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision   | 1.21 <b>100</b>                         |
| ZWMDW..K      | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision   | 1.21 <b>100</b>                         |
| ZWMDW..K2     | Airframe rolling bearings – Deep groove ball bearing double row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision   | 1.21 <b>100</b>                         |

<sup>1)</sup> Starting page of the product table.

| Designation | Product                                                                                                                                                                                        | Product table<br>No. Page <sup>1)</sup> |     | Designation | Product                                                                                                                                                                                                     | Product table<br>No. Page <sup>1)</sup> |     |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| ZWME..      | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                       | 2.6                                     | 172 | ZWMT..      | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                           | 2.15                                    | 202 |
| ZWME..      | Airframe spherical plain bearings – Metal-to-metal swaged narrow, AS 21154, AS 21155 (inch dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                     | 2.11                                    | 186 | ZWQ2PL..    | Airframe spherical plain bearings – Metal-to-metal swaged split (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                                    | 2.9                                     | 182 |
| ZWMKP..     | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.14                                    | 78  | ZWQ2PL..    | Airframe spherical plain bearings – Metal-to-metal swaged split (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                                      | 2.17                                    | 210 |
| ZWMKP..A    | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.15                                    | 80  | ZWQMA..     | Airframe spherical plain bearings – Metal-to-metal swaged light (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                                    | 2.5                                     | 168 |
| ZWMKP..B    | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.16                                    | 84  | ZWQME..     | Airframe spherical plain bearings – Metal-to-metal swaged narrow (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                                   | 2.6                                     | 172 |
| ZWMKP..BS   | Airframe rolling bearings – Deep groove ball bearing with self-aligning ring single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision | 1.22                                    | 102 | ZWQME..     | Airframe spherical plain bearings – Metal-to-metal swaged narrow, AS 21154, AS 21155 (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                 | 2.11                                    | 186 |
| ZWMKP..L    | Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision                         | 1.14                                    | 78  | ZWQML..     | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                                     | 2.7                                     | 176 |
| ZWMKSP..    | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23                                    | 106 | ZWQML..     | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                                       | 2.13                                    | 194 |
| ZWMKSP..A   | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23                                    | 106 | ZWQMT..     | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                        | 2.8                                     | 180 |
| ZWMKSP..L   | Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), cadmium plated corrosion-resistant-steel, reduced tolerance and SKF super precision                       | 1.23                                    | 106 | ZWQMT..     | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (inch dimensions), corrosion-resistant-steel inner ring and bronze aluminium outer ring cadmium plated                          | 2.15                                    | 202 |
| ZWML..      | Airframe spherical plain bearings – Metal-to-metal swaged wide (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                         | 2.7                                     | 176 | ZWT..       | Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), cadmium plated corrosion-resistant-steel                                                                               | 1.3                                     | 56  |
| ZWML..      | Airframe spherical plain bearings – Metal-to-metal swaged wide (inch dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                                           | 2.13                                    | 194 | ZXC..M      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel | 3.2                                     | 298 |
| ZWMT..      | Airframe spherical plain bearings – Metal-to-metal swaged high misalignment (metric dimensions), corrosion-resistant-steel inner ring and outer ring cadmium plated                            | 2.8                                     | 180 |             |                                                                                                                                                                                                             |                                         |     |

<sup>1)</sup> Starting page of the product table.

| Designation  | Product                                                                                                                                                                                                                            | Product table No. | Page <sup>1)</sup> |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| ZXC..ME      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                          | 3.2               | 298                |
| ZXC..MJ..    | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                                 | 3.1               | 296                |
| ZXCN...-     | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                          | 3.15              | 326                |
| ZXCN..E..    | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                            | 3.15              | 326                |
| ZXCN..JESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel with UNJF profile thread   | 3.14              | 322                |
| ZXCN..JSP..  | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel with UNJF profile thread | 3.14              | 322                |
| ZXCN..M      | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                        | 3.2               | 298                |
| ZXCN..ME     | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                          | 3.2               | 298                |
| ZXCN..MESP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel with UNF profile thread    | 3.14              | 322                |
| ZXCN..MESP1  | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), sealed bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                          | 3.2               | 298                |
| ZXCN..MJ..   | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                                 | 3.1               | 296                |

| Designation | Product                                                                                                                                                                                                                           | Product table No. | Page <sup>1)</sup> |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| ZXCN..MSP.. | Airframe rod ends – External thread rod end with integrated rolling bearing (inch dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel with UNF profile thread | 3.14              | 322                |
| ZXCN..MSP1  | Airframe rod ends – External thread rod end with integrated rolling bearing (metric dimensions), shielded bearing in corrosion-resistant-steel and rod end body in cadmium plated corrosion-resistant-steel                       | 3.2               | 298                |
| ZXRA..      | For the cross-reference designation of this legacy product, see ZLEN..                                                                                                                                                            |                   |                    |
| ZXRE..      | For the cross-reference designation of this legacy product, see ZNEN.., ZNAS..                                                                                                                                                    |                   |                    |
| ZXRE..A..   | For the cross-reference designation of this legacy product, see ZNAS..A..                                                                                                                                                         |                   |                    |
| ZXRL..      | For the cross-reference designation of this legacy product, see ZWEN.., ZWAS..                                                                                                                                                    |                   |                    |
| ZXRL..A..   | For the cross-reference designation of this legacy product, see ZWAS..A..                                                                                                                                                         |                   |                    |
| ZXRL..FR..  | Airframe spherical plain bearings – Self-lubricating pre-staked (metric dimensions), cadmium plated                                                                                                                               | 2.23              | 228                |
| ZXRT..      | Airframe spherical plain bearings – Self-lubricating high-misalignment (metric dimensions), cadmium plated                                                                                                                        | 2.22              | 226                |
| ZXRT..      | Airframe spherical plain bearings – Self-lubricating high-misalignment (inch dimensions), cadmium plated                                                                                                                          | 2.33              | 260                |

<sup>1)</sup> Starting page of the product table.

