Aerospace solutions

SKF mobile apps and useful links

SKF mobile apps are available from both Apple App Store and Google Play. These apps provide useful information about SKF Group at your fingertips.

You can find information about SKF products beyond aerospace, including industrial rolling bearings with links to the related catalogues.

Apple App Store

Google Play

To download a PDF document of this catalogue and for more information about the SKF Aerospace solutions, go to skf.com/go/aero. Please note product data in this printed catalogue was accurate on the day of printing. The latest product data is always available for you on skf.com.

Scancode Aero catalogue download

To find support from SKF experts, for queries and to place orders, relevant contacts are available at our contact page on skf.com

Scancode Contacts

skf.com

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Aerospace

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7 Engineered composite solutions 428

B Customized bearings for aeroengine solutions

C Other aerospace solutions

D Index

Unit conversions

Quantity	Unit	Conversion			
Length	inch	1 mm	0.03937 in	1 in	25,4 mm
Area	square inch	1 mm^2	0.00155 in^2	1 in^2	645,16 mm^2
	square foot	1 m^2	10.76 ft^2	1 ft^2	0,0929 m^2
Volume	cubic inch	1 cm^3	0.061 in^3	1 in^3	16,387 cm^3
	cubic foot	1 m^3	35 ft^3	1 ft^3	0,02832 m^3
	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
Speed, velocity	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
Mass	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
Density	pound per cubic inch	1 g/cm^3	0.0361 lb/in^3	1 lb/in^3	27,68 g/cm^3
Force	pound-force	1 N	0.225 lbf	1 lbf	4,4482 N
Pressure, stress	pounds per square inch	1 MPa	145 psi	1 psi	6,8948 × 10^3 Pa
		1 N/mm^2	145 psi		
		1 bar	14.5 psi	1 psi	0,068948 bar
Moment	pound-force inch	1 Nm	8.85 lbf-in	1 lbf-in	0,113 Nm
Power	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
Temperature	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 units 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.

SKF Group

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).

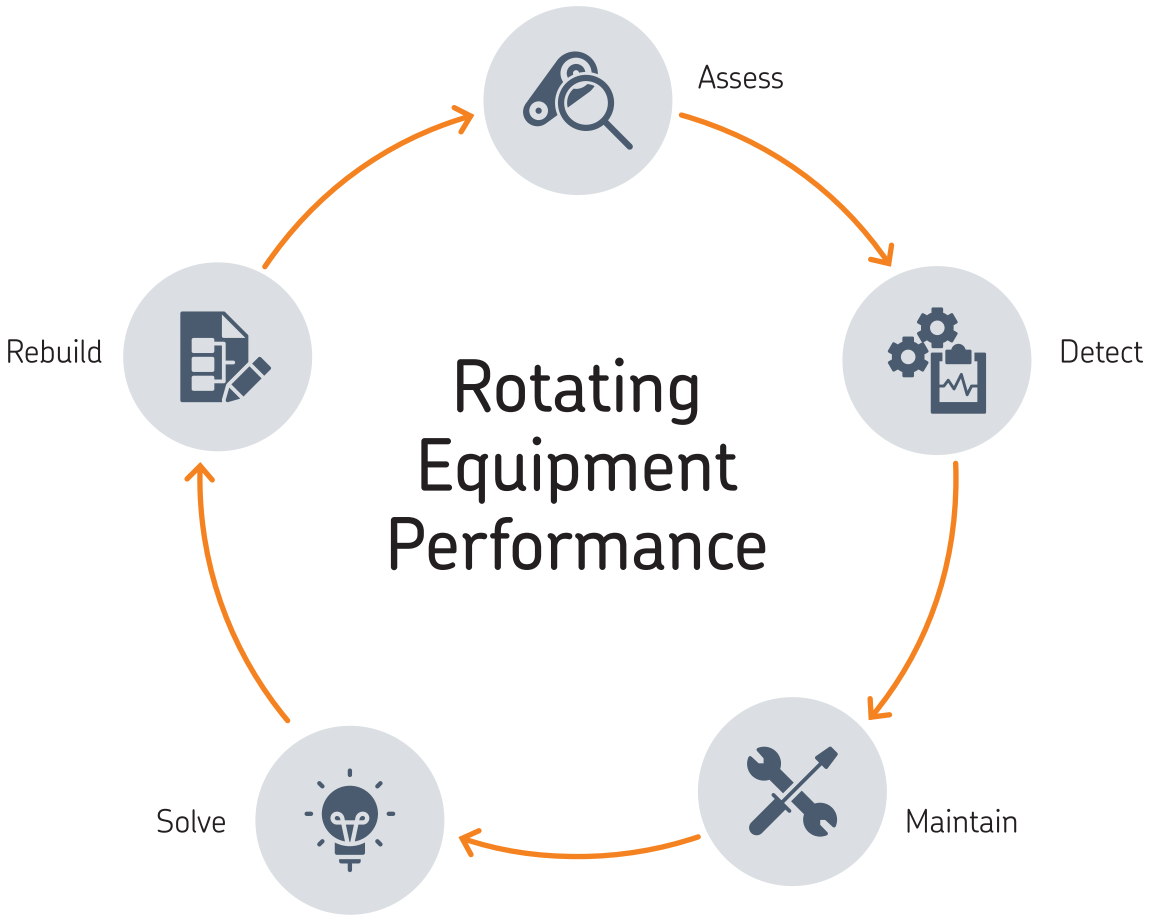
Sustainability

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_2 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.

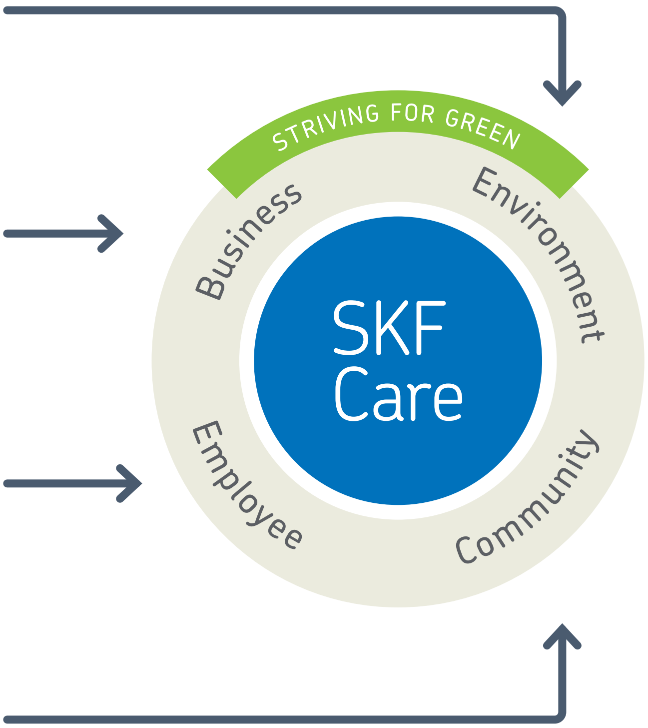
This is for the benefit of our business partners, customers, our employees, the natural environment and the communities around us. What we do creates shared value across all these perspectives:

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[1] (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
- **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
- **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 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.

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[1] 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 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.

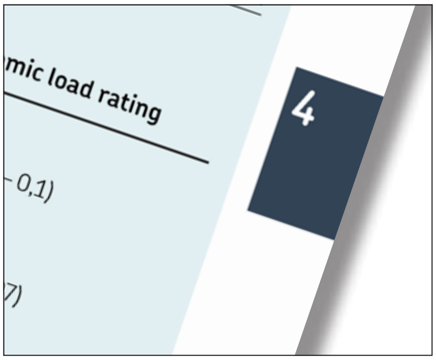
How to use the catalogue

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

Principles of bearing selection

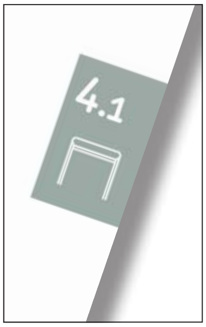
This part is marked with blue bars at the page edge. It provides general relevant information about:

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

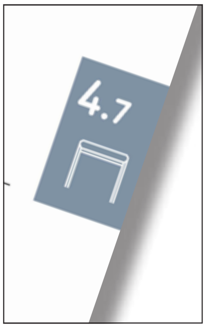


Product tables

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.



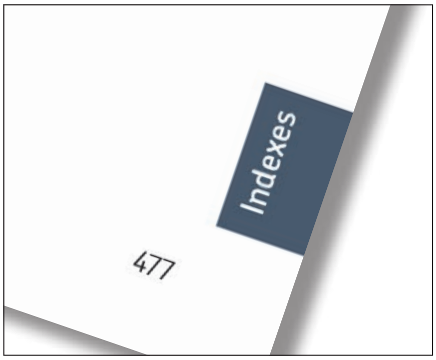
Metric



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 19** 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

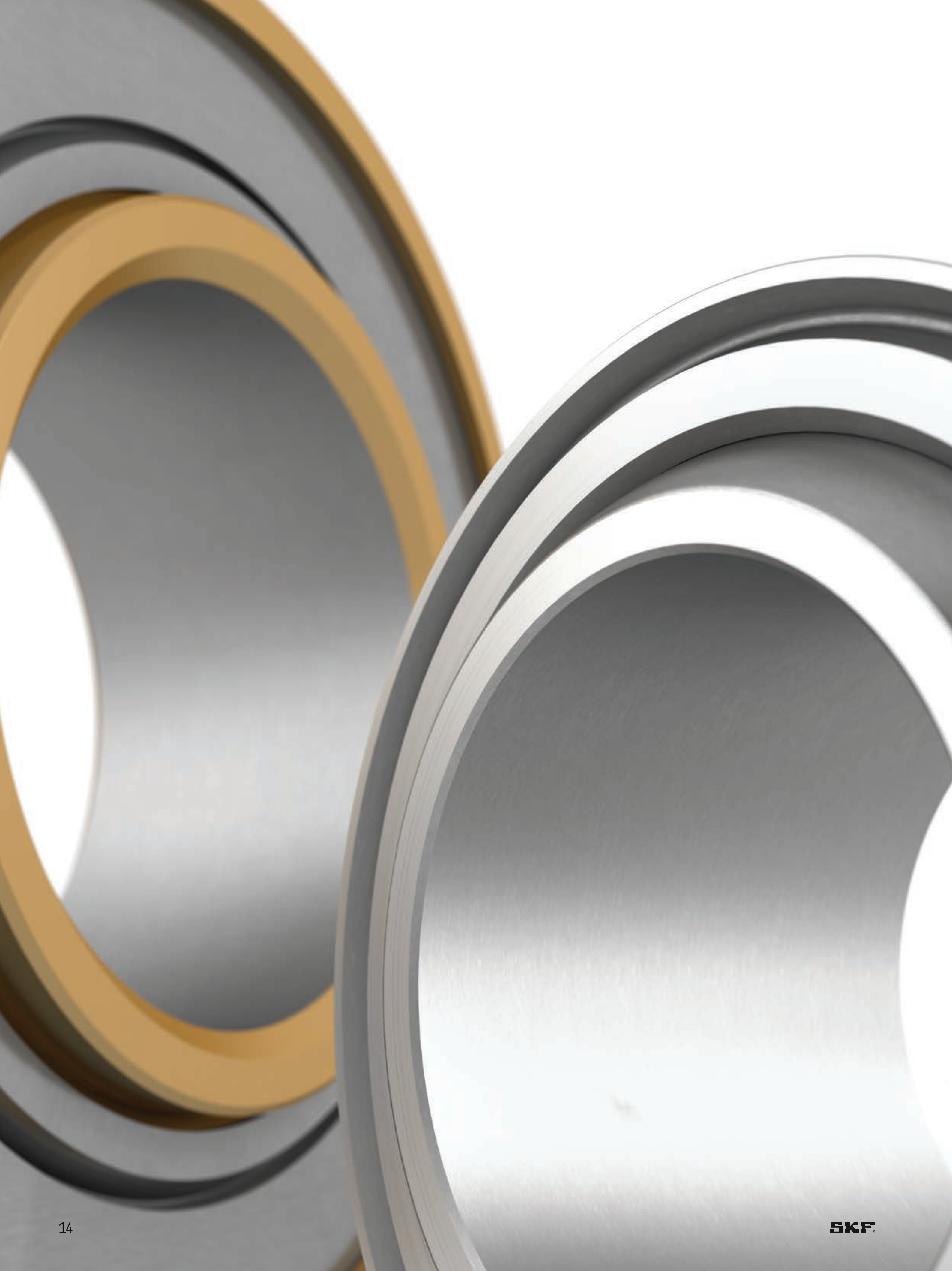
The easiest way to find detailed information about a bearing for which you have the designation is to use the product index, **page 477**. Compare the initial characters in a bearing designation with the entries in the product index. Each entry specifies the related bearing type, and the relevant product section and product table. To understand the product series used in a bearing designation, go to the text index, **page 477**, 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 141** provides the cross-reference for the relevant self-lubricating spherical plain bearings and **table 9 page 285** 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 477** can also be used. Search for the initial characters of a legacy bearing to find the related cross-reference.



A Airframe solutions

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

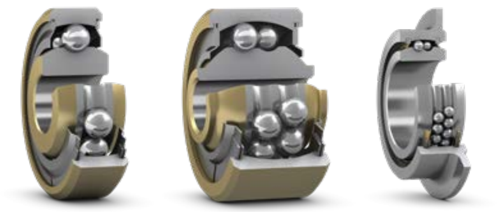
Airframe rolling bearings are full complement bearings (i.e. bearings without a cage and with a full complement of rolling elements) that enable rotational movements with minimal friction.

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.

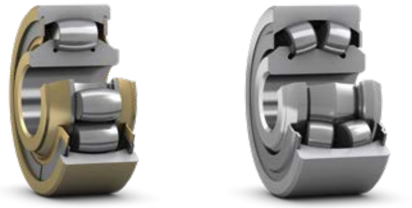
When an attachment solution is needed, airframe rolling bearings can be integrated into rod end bodies. Refer to *Rod ends* **page 270**.

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, refer to *Rolling Bearings* **page 20** and *Aerospace specialty and engineered balls* **page 458**.

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 270**.

The SKF spherical plain bearing standard assortment is comprised of:

SL[1] bearings swaged

SL[1] bearings pre-staked

SL[1] bearings swaged high misalignment

MM[2] bearings slotted

MM[2] bearings swaged

MM[2] bearings split

MM[2] bearings swaged high misalignment

For more information, refer to *Spherical plain bearings*, **page 116**.

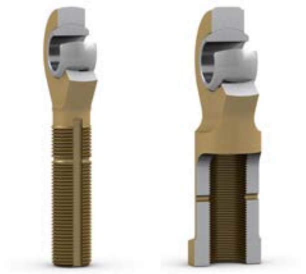
Rod ends

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[1] or MM[2])



Rod ends with integrated MM spherical plain bearings

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

For more information, refer to *Rod ends* **page 270**.

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[1] SL = Self-lubricating

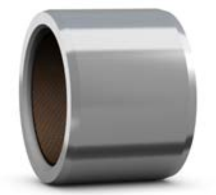
[2] MM = Metal-to-metal

Self-lubricating journal bearings

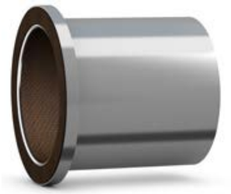
Airframe journal bearings are “maintenance-free” and compact solutions that enable low friction rotation and sliding guidance by providing a self-lubricating and wear-resistant surface, while limiting constraints on the assembly when replacement is required.

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

For more information, refer to *Journal bearings*, **page 380**.



Plain journal bearings



Flanged journal bearings

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 19**, 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, dismounting 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 418**)
- Needle bearings (**page 426**)
- Composite solutions (**page 428**)

For more information, contact SKF via: skf.com/go/aero

Basic bearing type selection guide

Based on their key characteristics (**table 1**), an initial decision must be made between using a standard SKF Aerospace self-lubricating journal bearing, spherical plain bearing, or rolling bearing.

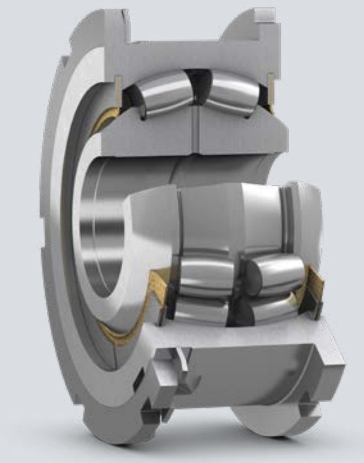
Table 1

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

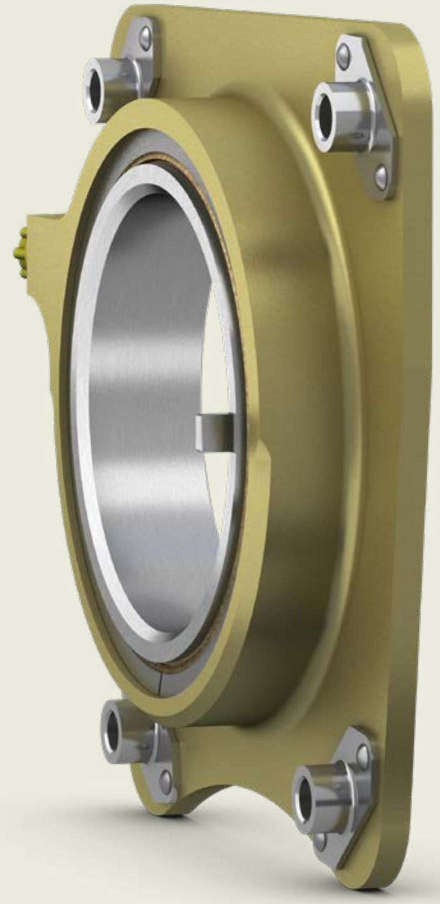
When an attachment and positioning solution to the application is needed, rod ends can be used.

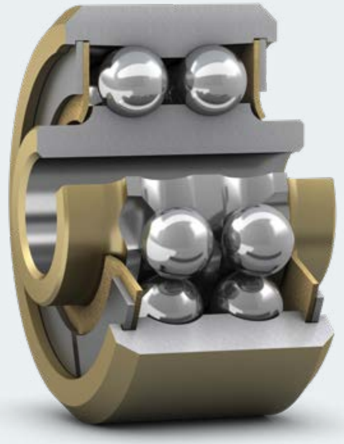
For more information, refer to the relevant product chapter.
For more solutions, refer to the customized and engineered bearing sections in the relevant product chapter and contact SKF via: skf.com/go/aero.



1

Rolling bearings





1 Rolling bearings

1 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 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:

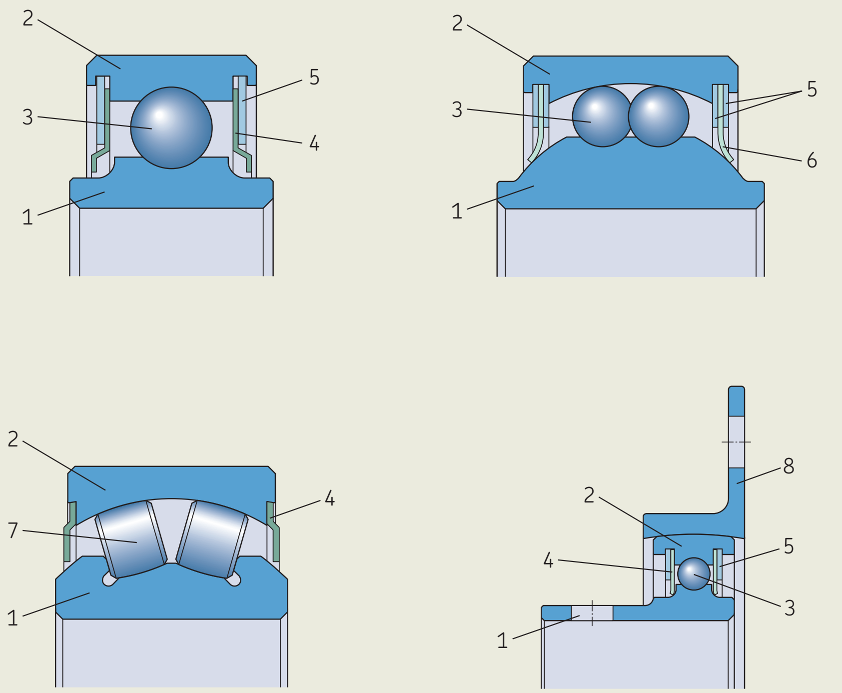
- Flight controls
- Actuators, attachment points and hinges
- Doors
- Helicopter rotors

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 41**.

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

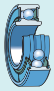
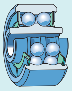
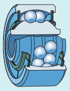
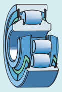
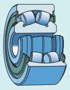
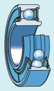
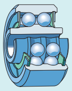
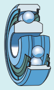
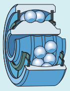
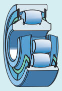
Type	Number of rows	Standard	SKF series	Table number	Page
Deep groove ball bearing 	Single	–	JN..	2.1	42
		EN 3284, EN 3285, EN 3286 EN 3045, EN 3046, EN 3047	JNA..	2.2	44
		–	T..	2.3	46
		EN 3281, EN 3282, EN 3283 EN 4033	TA..	2.4	48
	Double	–	AG..	2.5	50
		EN 3056, EN 3057, EN 3058	AGN...	2.6	52
Deep groove ball bearing with self-aligning ring 	Single	EN 3059, EN 3060, EN 3061	TRCE..	2.7	54
		EN 4041	TRCEI..	2.8	56
Self-aligning ball bearing 	Double	EN 3287, EN 3288, EN 3289	KN..	2.9	58
		EN 4034	KNRCE..	2.10	60
Spherical roller bearing 	Single	EN 3053, EN 3054, EN 3055	K..F, KN..F, K..FE.. SP1, KN..FE..SP1	2.11	62
		EN 3290, EN 3291, EN 3292	KNA..F	2.12	64
	Double	–	K..D	2.13	66

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	2.14	68
		AS 27641	KP..A	2.15	70
		AS 27642	KP..B	2.16	74
		–	KP..SP.., KP..A..SP.., KP..L..SP..	2.17	80
		AS 27646 AS 21428	B500..	2.18	82
	Double	–	B5500..	2.19	86
		AS 27644	DPP..	2.20	88
		AS 27647	DW.., DW..K2, DW..K	2.21	90
Deep groove ball bearing with self-aligning ring 	Single	AS 27648	KP..BS	2.22	92
Self-aligning ball bearing 	Single	AS 27645	KSP.., KSP..A, KSP..L	2.23	96
		–	KSP..SP.., KSP..A..SP..	2.24	100
	Double	–	KN..	2.25	102
		AS 27643	DSP..	2.26	104
Spherical roller bearing 	Single	–	DSRP..	2.27	106

Variants

Bearing materials

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 41**.

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 36**.

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 30.**

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 270**.

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 41**.

Contact your regional SKF partner via: 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

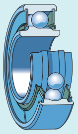
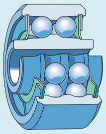
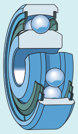
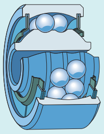
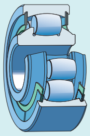
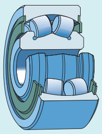
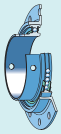
Basic selection criteria

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.

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.

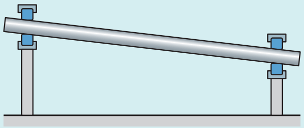
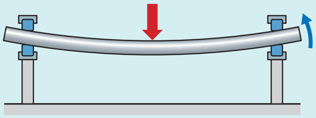
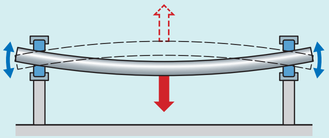
Rotational frictional moment

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 30**.

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.	

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 26**.
3 Determine the static radial and axial load requirements, refer to *Bearing load carrying capability* **page 27**.
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 28** 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.

7 Verify other parameters or select suitable bearing variant:

- Select grease and verify operating temperature range. Refer to *Lubrication* **page 29** and *Operating temperature* **page 30**.
- Select sealing or shielding solution. Refer to *Sealing and shielding* **page 30**.
- Verify starting torque. Refer to *Friction and torque* **page 31**.
- Verify internal clearances and bearing precision. Refer to *Internal clearance* **page 37**.
- Select materials and surface treatments. Refer to *Material* **page 35** and *Surface treatments* **page 36**.
- Select fits and axial location conditions based on mating parts information. Refer to *Bearing interfaces* **page 32**.

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 41**.

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.

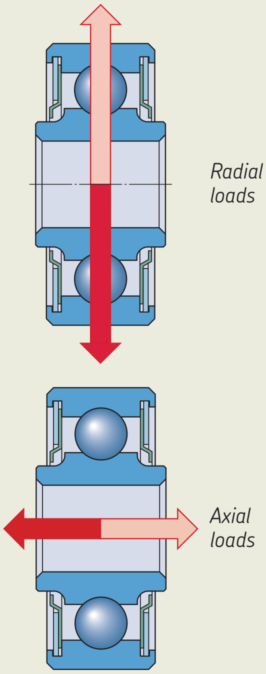
Static ultimate loads are defined as 1.5 times the static limit loads:

Radial static ultimate load = $1.5\ C_s$
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.

Figure 3

Radial and axial loads



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:

$$P_s = F_r + Y_s F_a$$

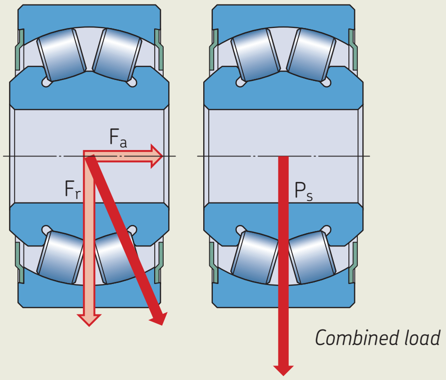
Where
P_s Equivalent radial static load [lbf/kN]
F_r Radial component of the applied load [lbf/kN]
F_a axial component of the applied load [lbf/kN]
Y_s Axial load factor, depending on bearing type:
= 3.2 for double row self-aligning ball bearings
= 3.3 for single row spherical roller bearings
= 1.6 for 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]

Figure 4

Combined loads



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 $\alpha = 90°$ oscillation (**figure 5**) before evidence of contact fatigue (spalling) occurs.

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 29** 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.

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

$$L = K \frac{90}{\alpha} \left(\frac{D.L.r}{P}\right)^{11/3}$$

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

α 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 $\frac{F_r}{F_a}$ = for ball bearings
(Deep groove ball bearings, self-aligning ball bearings and deep groove ball bearings with self-aligning ring)
0 for single row spherical roller bearings[1]
2.5 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]

Figure 5

Oscillation angle (α)

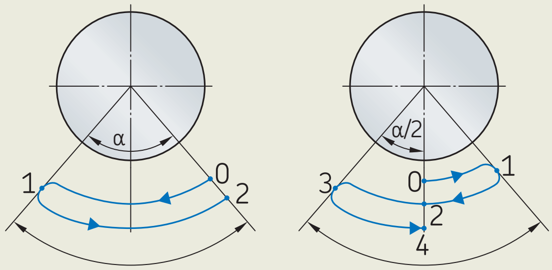


Table 5

Standard greases

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

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.

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[1] 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

The permissible operating temperature of airframe rolling bearings is typically limited by the grease capability. Refer to *Lubrication* **page 29** 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:

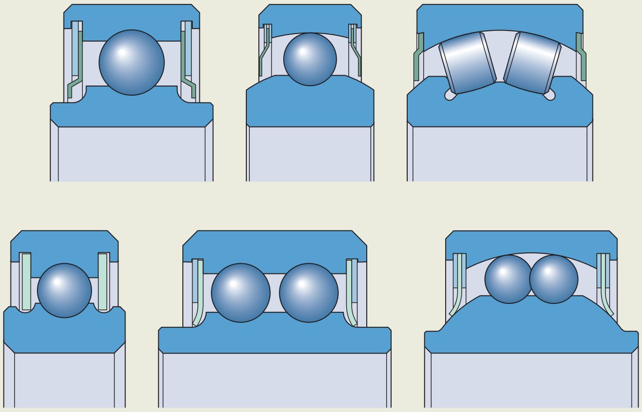
- Contamination is moderate to heavy
- There is a risk of contact with moisture or water spray

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 31**.

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 29**), bearing internal clearance (refer to *Bearing interfaces* **page 32**), bearing fits (refer to *Bearing fits* **page 32**), and sealing (refer to *Sealing and shielding* **page 30** and *Seal friction* **page 31**).

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.

Diagram 1

Rotational frictional moment

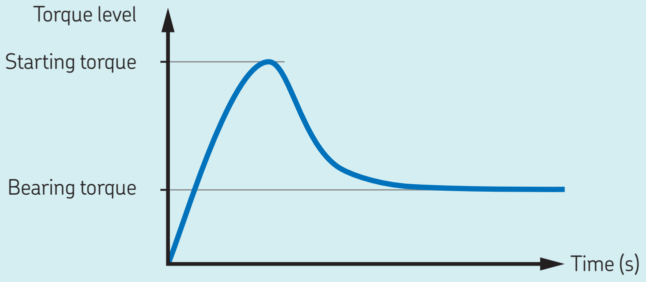


Figure 7

Bearing torque

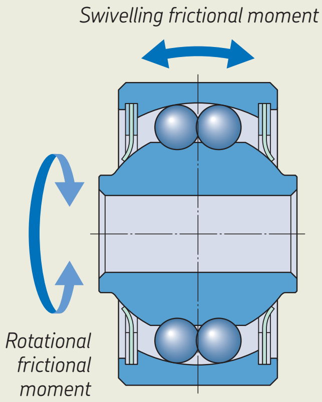
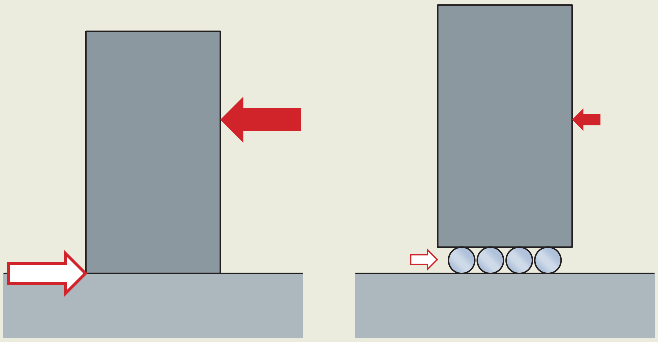


Figure 8

Bearing friction



Sliding friction

Rolling friction

Bearing interfaces

Selecting fits

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 34** 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 37**.

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

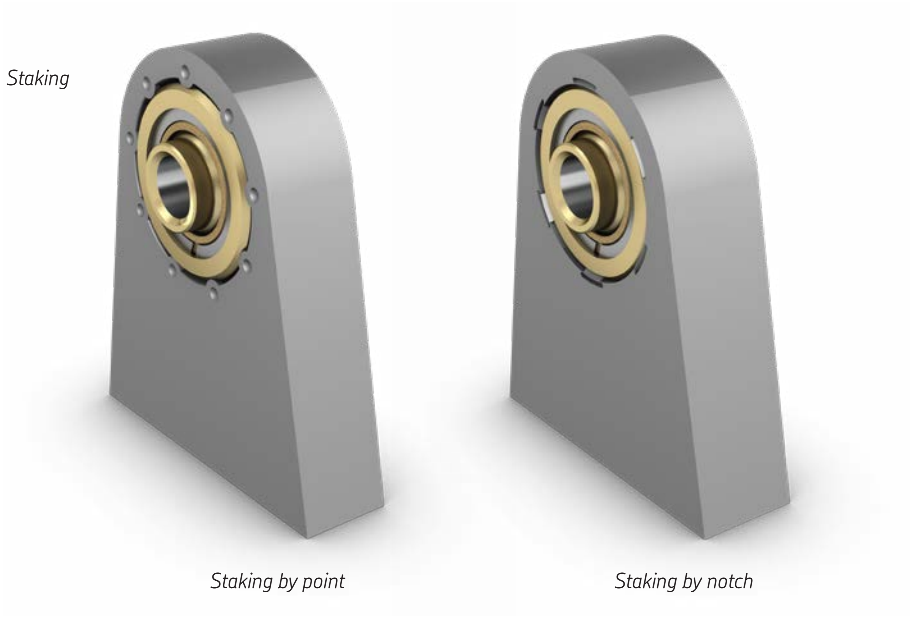
When bearings are subjected to axial loads, it is not sufficient to use an interference fit alone to axially locate the bearing in a cylindrical housing bore. Common ways of locating bearing rings axially in a housing bore are by staking or using flanges.

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 or by notch staking at multiple points around the circumference of the housing's bore diameter. See **figure 9**.

Figure 9. Staking



Staking by point

Staking by notch

Table 6

Housing interference for deep groove ball bearings

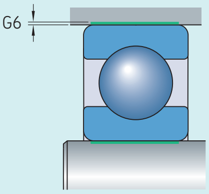
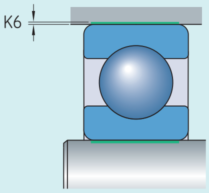
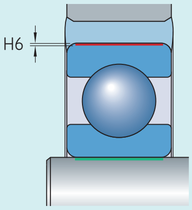
D		**Light alloy housing**		**Steel housing**	
>	≤	Light interference	Normal interference	Light interference	Normal interference
mm		µm			
16	24	4–8	8 – 12	2 -6	5–9
24	32	8–12	12 – 16	4–8	8–12
32	48	10–14	14 – 18	6–10	10–14
48	78	12–16	16 – 20	7–11	11–15
78		14–18	18 – 22	9–13	13–17

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)	**Table 6** for deep groove ball bearings **Table 7** for self-aligning ball bearings and spherical roller bearings	Increased clearance	Standard clearance	Low internal clearance reduction
Transition fit		Standard clearance	Reduced clearance	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.

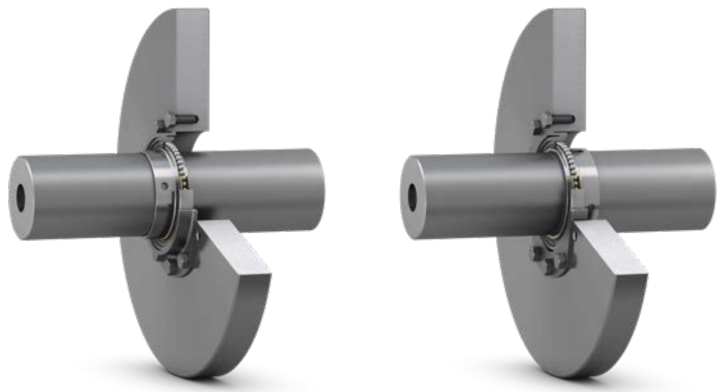


Figure 11

Flanged units

Figure 10

Locating flanged units with positioning holes

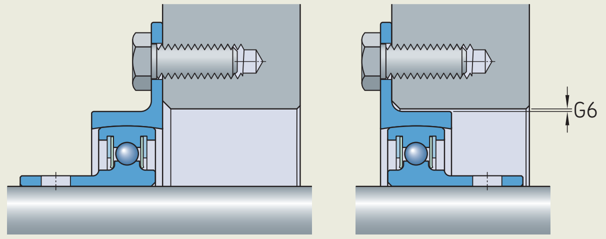


Figure 12

Flanged bearing

Bearing data

Dimensions and tolerances

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

Where
Δdmp = Single plane mean bore diameter deviation
ΔDmp = Single plane mean outside diameter deviation

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

And
Δds = Deviation of a single outside bore diameter
ΔDs = 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
Kia = Radial run-out of assembled bearing inner ring
Kea = Radial run-out of assembled bearing outer ring
Sia = Inner ring side run-out with raceway
Sea = Outer ring side run-out with raceway

Figure 14 shows the measurement definition for the bearing run-outs:

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 41**.

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 ABMA1) 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 41** for specific materials).

Figure 13

Dimensional tolerances measurement principle

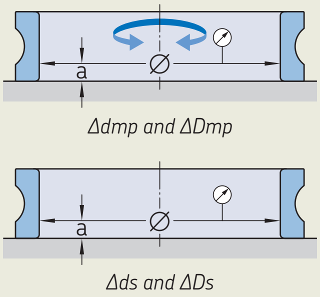
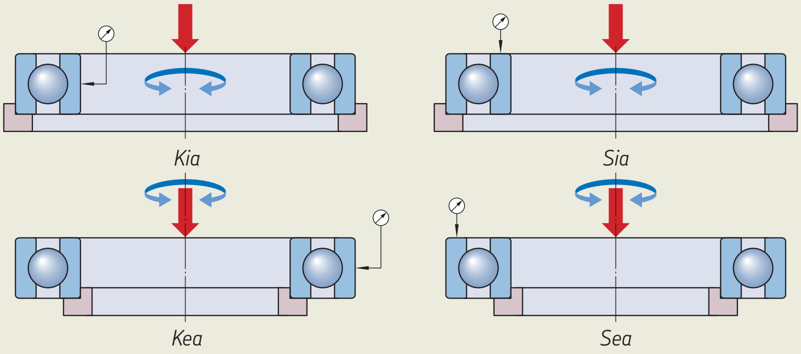


Figure 14

Geometrical tolerances



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1) ABMA is American Bearing Manufacturers Association standards

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 128** 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 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, 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 41**.

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 Inch bearings : 60 to 66	52100	EN 2031	AMS 6440 or AMS 6444	100Cr6 (100C6)
Corrosion-resistant steel	Good	≥ 58	440C	EN 2030	AMS 5630 or AMS 5618	X105CrMo17 (Z100CD17)

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 H1000	EN 2539	AMS 5643	Z6CNU17.04 H1000
Bearing steel	Moderate	52100	EN 2031	AMS 6440 or AMS 6444	100Cr6 (100C6)
Corrosion-resistant steel	Good	431	EN 2136	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 (**figure 17**) 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

Figure 16

Diagonal internal clearance

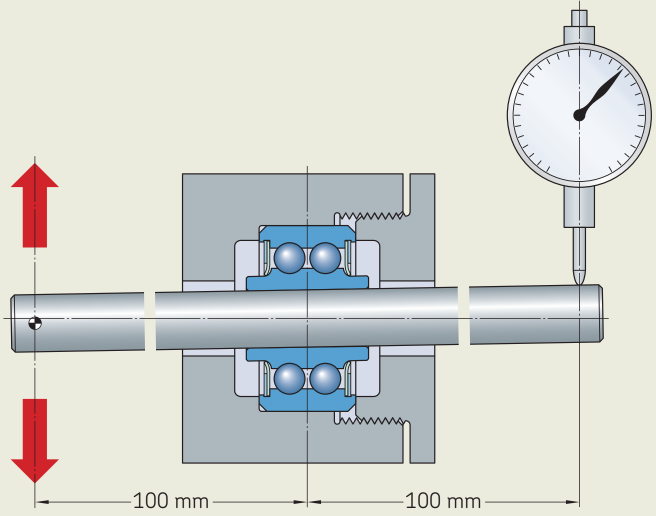
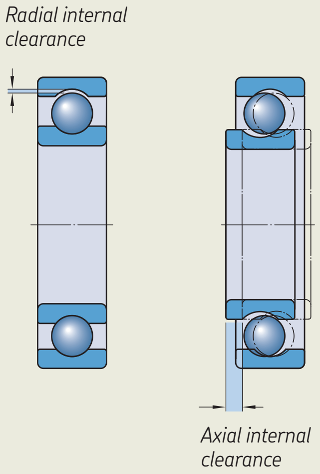


Figure 17

Radial and 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 41**.

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

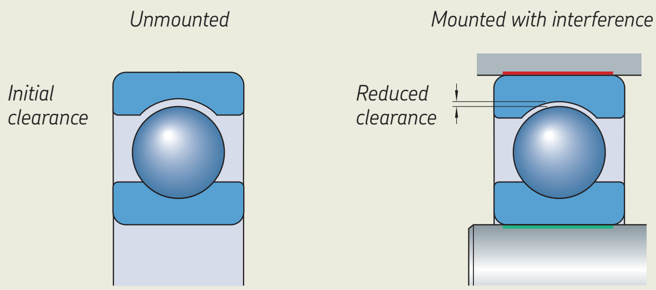
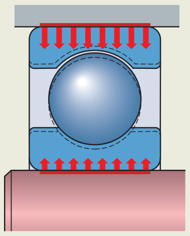


Figure 19

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 40**.

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

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.

Figure 21

Bearing mounting on shaft

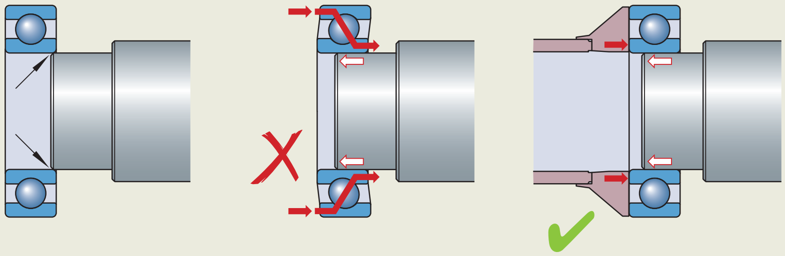


Figure 20

Mounting tool

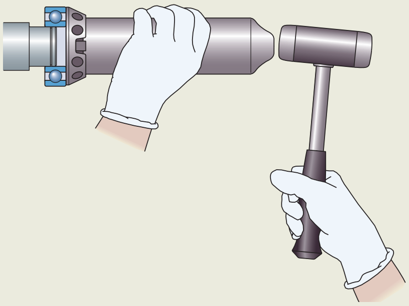
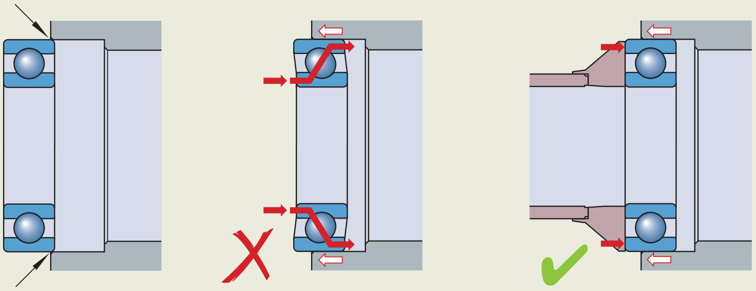


Figure 22

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 32**).

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

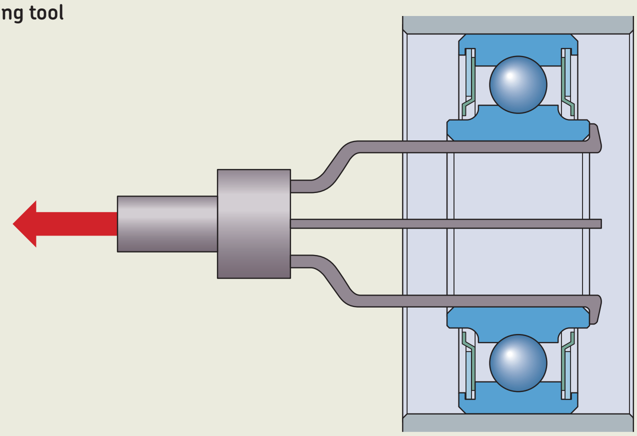
The maximum recommended storage time for SKF standard bearings is five years (starting from the date indicated on SKF's packaging).

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

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.

Legacy standards

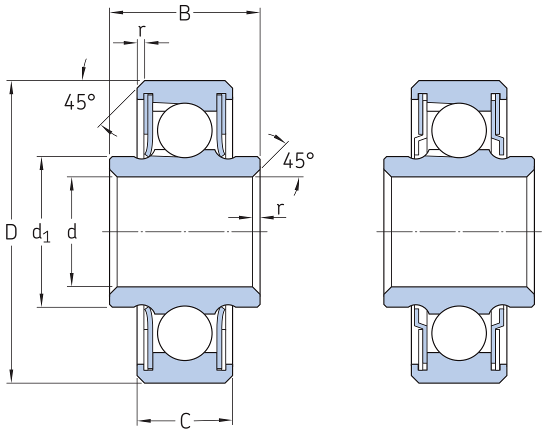
SKF can supply bearings compliant to the following legacy standards:

- 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

1.1 Deep groove ball bearing single row (Metric dimensions)

JN..

Technical specification	EN 3280
Product standard	–



Dimensions and tolerances

Nominal bore code	Dimensions d	Δdmp	Δds	D	ΔDmp	ΔDs	C 0 –0,12	B 0 –0,12	d_1 ≈	r +0,3 –0,2	Mass ≈	Tolerances Kia max Standard	Precision
–	mm	µm		mm	µm		mm				g	µm	
5	5	0/–8	+2/–10	16	0/–8	+2/–10	5	7	7,1	0,5	4	25	6
6	6	0/–8	+2/–10	19	0/–9	+2/–11	6	8	8,2	0,5	9	25	6
8	8	0/–8	+2/–10	22	0/–9	+2/–11	7	11	10,6	0,5	13	25	6
10	10	0/–8	+2/–10	26	0/–9	+2/–11	8	12	12,6	0,5	23	25	6
12	12	0/–8	+3/–11	28	0/–9	+3/–11	8	12	14,7	0,5	26	25	7
15	15	0/–8	+3/–11	32	0/–11	+3/–14	9	13	17,7	0,5	35	25	7
17	17	0/–8	+3/–11	35	0/–11	+3/–14	10	14	20,2	0,5	45	25	7
20	20	0/–10	+3/–13	42	0/–11	+3/–14	12	16	23,5	0,5	75	25	8
25	25	0/–10	+3/–13	47	0/–11	+3/–14	12	16	28,6	0,5	88	25	8
30	30	0/–10	+3/–13	55	0/–13	+3/–17	13	19	34,1	0,5	133	25	8

Tolerances cont., loads, clearance and torque

Nominal bore code	Tolerances Kea max Standard	Precision	Sia max Standard	Precision	Sea max Standard	Precision	Static limit loads Radial C_s	Axial C_a	Clearance Standard Radial	Increased Radial	Maximum starting torque Shielded	Sealed
–	µm						kN		µm		mNm	
5	40	8	40	15	40	20	6,9	3,1	2/13	7/15	2	4
6	40	10	40	15	40	20	9,8	4,4	2/13	7/15	2,5	5
8	40	10	40	15	40	20	12	5,4	2/13	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 JN5	Z	W	JN	20	E	D	J7-15	G81	CP55	R10

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

Shield and seal

No code	Shielded
E	Sealed

Tolerances

No code	Standard
D	Precision

Radial clearance

No code	Standard clearance
J7-15	Increased clearance

Lubrication

No code	Grease G354
G81	Grease G395

Passivation

No code	Not treated
CP55[1]	Passivated corrosion-resistant steel

Oversize

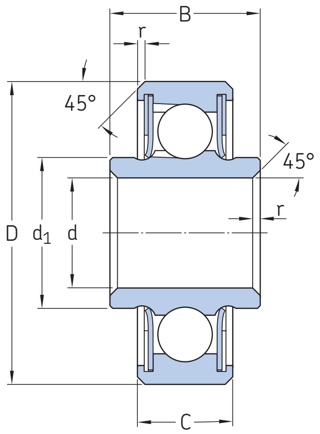
No code	Standard outer diameter size
R10	0,1 mm oversized outer diameter
R20	0,2 mm oversized outer diameter

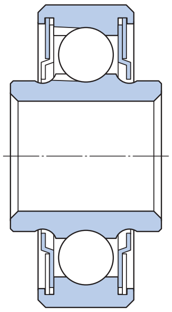
---

[1] Available only for corrosion-resistant steel material without other surface treatment

1.2 Deep groove ball bearing single row, EN 3284, EN 3285, EN 3286, EN 3045, EN 3046, EN 3047 (Metric dimensions)

JNA..





Technical specification	EN 3280
Product standard	
Standard tolerances:	EN 3284 (Bearing steel) EN 3285 (Bearing steel cadmium plated) EN 3286 (Corrosion-resistant steel)
Precision tolerances:	EN 3045 (Bearing steel) EN 3046 (Bearing steel cadmium plated) EN 3047 (Corrosion-resistant steel)

Dimensions and tolerances

Nominal bore code	Dimensions										Mass	Tolerances			
	d	Δdmp	Δds	D	ΔDmp	ΔDs	C 0 −0,12	B 0 −0,12	d_1 ≈	r +0,3 −0,2	≈	Kia max Standard	Kia max Precision	Kea max Standard	Kea max Precision
–	mm	µm		mm	µm		mm				g	µm			
5	5	0/–8	+2/–10	16	0/–8	+2/–10	5	7	7,6	0,5	4	25	6	40	8
6	6	0/–8	+2/–10	19	0/–9	+2/–11	6	8	8,6	0,5	9	25	6	40	10
8	8	0/–8	+2/–10	22	0/–9	+2/–11	7	9	10,6	0,5	12	25	6	40	10
10	10	0/–8	+2/–10	26	0/–9	+2/–11	8	10	12,6	0,5	21	25	6	40	10
12	12	0/–8	+3/–11	28	0/–9	+3/–11	8	10	14,7	0,5	24	25	7	40	10
15	15	0/–8	+3/–11	32	0/–11	+3/–14	9	11	17,7	0,5	32	25	7	40	10
17	17	0/–8	+3/–11	35	0/–11	+3/–14	10	12	20,2	0,5	42	25	7	40	10
20	20	0/–10	+3/–13	42	0/–11	+3/–14	12	14	23,5	0,5	72	25	8	40	10
25	25	0/–10	+3/–13	47	0/–11	+3/–14	12	14	28,6	0,5	85	25	8	40	10
30	30	0/–10	+3/–13	55	0/–13	+3/–17	13	15	34,1	0,5	123	25	8	40	10

Tolerances cont., loads, clearance and torque

Nominal bore code	Tolerances				Static limit loads		Clearances					Maximum starting torque	
	Sia max Standard	Sia max Precision	Sea max Standard	Sea max Precision	Radial C_s	Axial C_a	Standard Radial	Axial max	Reduced Radial	Axial max	Increased Radial	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
JNA5J7-15

Z W JNA 20 E D N744 CP55 R10

Surface treatment

No code	Not plated steel
Z	Cadmium plated steel
SZ[1]	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**
J7-15[1]	Standard	G354	Increased
DJ7-15[1]	Precision	G354	Increased
J7-15G81[1]	Standard	G395	Increased
DJ7-15G81[1]	Precision	G395	Increased
No code[1]	Standard	G354	Reduced
DN744	Precision	G354	Reduced
DN814	Precision	G395	Reduced
N813[2]	Standard	G395	Standard
N743[3]	Standard	G354	Standard

Passivation

No code	Not treated
CP55[4]	Passivated corrosion-resistant steel

Oversize

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

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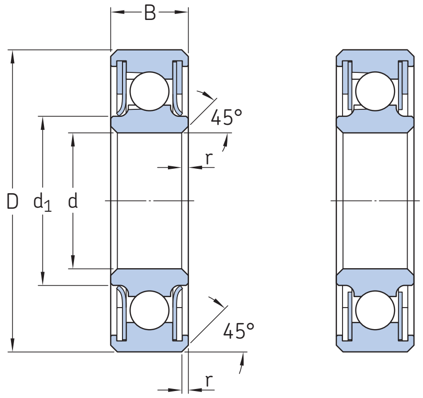
[1] SKF option
[2] Replaces N811
[3] Replaces N741
[4] SKF option, available only for corrosion-resistant steel material without other surface treatment

1.3 Deep groove ball bearing single row (Metric dimensions)

T..



Technical specification	EN 3280
Product standard	–

Dimensions and tolerances

Nominal bore code	**Dimensions** d	Δdmp	D	ΔDmp	C 0 –0,12	B 0 –0,12	d_1 ≈	r +0,3 –0,2	**Mass** ≈	**Tolerances** Kia max Standard	Precision
–	mm	µm	mm	µm	mm				g	µm	
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
T40

Z WA T 20 E D J12-18 G81 CP55 R10

Surface treatment

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

Material

No code	Bearing steel
WA	Corrosion-resistant steel

Basic designation

Bore code

Shield and seal

No code	Shielded
E	Sealed

Tolerances

No code	Standard
D	Precision

Radial clearance

No code	Standard clearance
J12-18	Increased clearance

Lubrication

No code	Grease G354
G81	Grease G395

Passivation

No code	Not treated
CP55[1]	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

---

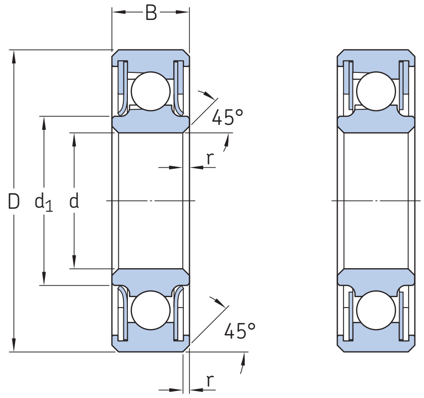
[1] Available only for corrosion-resistant steel material without other surface treatment

Tolerances cont., loads, clearance and torque

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

1.4 Deep groove ball bearing single row, EN 3281, EN 3282, EN 3283, EN 4033 (Metric dimensions)

TA..



Technical specification	EN 3280
Product standard	
Standard tolerances:	EN 3281 (Bearing steel) EN 3282 (Bearing steel cadmium plated) EN 3283 (Corrosion-resistant steel)
Precision tolerances:	EN 4033 (Corrosion-resistant steel)

Dimensions and tolerances

Nominal bore code	**Dimensions** d	Δdmp	D	ΔDmp	C 0 −0,12	B 0 −0,12	d_1 ≈	r +0,3 −0,2	**Mass** ≈	**Tolerances** Kia max Standard	Precision	Kea max Standard	Precision
–	mm	µm	mm	µm	mm				g	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 bore code	**Tolerances** Sia max Standard	Precision	Sea max Standard	Precision	**Static limit loads** Radial C_s	Axial C_a	**Clearances** Standard Radial	Axial max	Reduced Radial	Axial max	Increased Radial	**Maximum starting torque** 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	6/20	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
TA40J12-18

Z WA TA 20 E D N743 CP55 R10

Surface treatment

No code	Not plated steel
Z	Cadmium plated steel
SZ1)	Zinc-nickel plated steel

Material

No code	Bearing steel
WA	Corrosion-resistant steel

Basic designation

Bore code

Shield and seal

No code	Shielded
E	Sealed

Tolerances

No code	Standard
D1)	Precision

Variation

	Lubricant	**Clearances**
J12-181)	G354	Increased
J12-18G811)	G395	Increased
N7452)	G354	Reduced
N815	G395	Reduced
N8133)	G395	Standard
N7434)	G354	Standard

Passivation

No code	Not treated
CP555)	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

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1) SKF option
2) Replaces no code
3) Replaces N811
4) Replaces N741
5) Available only for corrosion-resistant steel material without other surface treatment

1.5 Deep groove ball bearing double row (Metric dimensions)

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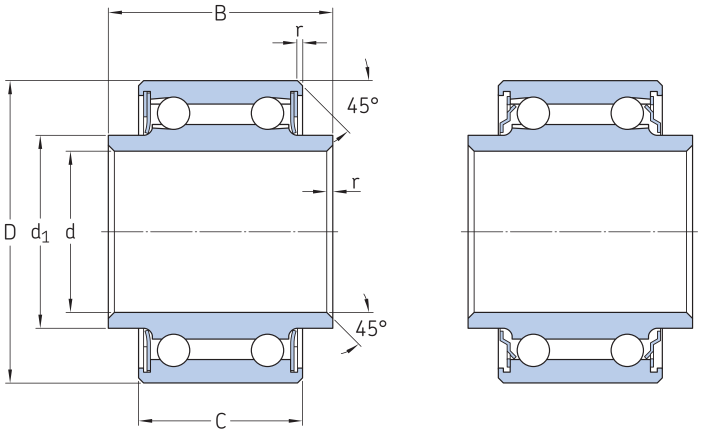
Technical specification	EN 3280
Product standard	–



Dimensions and tolerances

Nominal bore code	**Dimensions**										**Mass**	**Tolerances**	
	d	Δdmp	Δds	D	ΔDmp	ΔDs	C 0 –0,12	B 0 –0,12	d_1 ≈	r +0,3 –0,2	≈	Kia max Standard	Precision
–	mm	µm		mm	µm		mm				g	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**	
	Kea max Standard	Precision	Sia max Standard	Precision	Sea max Standard	Precision	Radial C_s	Axial C_a			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
AG6

Z W AG 10 E D J7-15 G81 CP55 R10

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

Shield and seal

No code	Shielded
E	Sealed

Tolerances

No code	Standard
D	Precision

Radial clearance

No code	Standard clearance
J7-15	Increased clearance

Lubrication

No code	Grease G354
G81	Grease G395

Passivation

No code	Not treated
CP55[1]	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

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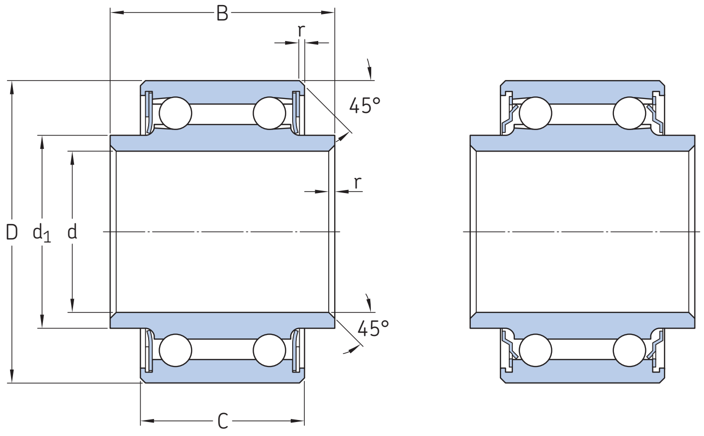
[1] SKF option, available only for corrosion-resistant steel material without other surface treatment

1.6 Deep groove ball bearing double row, EN 3056, EN 3057, EN 3058 (Metric dimensions)

AGN..



Technical specification	EN 3280
Product standard	
Standard tolerances:	EN 3056 (Bearing steel) EN 3057 (Bearing steel cadmium plated) EN 3058 (Corrosion-resistant steel)

Dimensions and tolerances

Nominal bore code	**Dimensions**										**Mass**	**Tolerances**	
	d	Δdmp (J7)	Δds	D	ΔDmp	ΔDs	C 0 −0,12	B 0 −0,12	d_1 ≈	r +0,3 −0,2	≈	Kia max Standard	Precision
–	mm	µm		mm	µm		mm				g	µm	
8	8	+8/–7	+2/–10	22	0/–8	+2/–11	17	22	10,6	0,5	30	25	6
10	10	+8/–7	+2/–10	26	0/–8	+2/–11	18	24	12,6	0,5	52	25	6
12	12	+10/–8	+3/–11	28	0/–8	+2/–11	18	24	14,7	0,5	60	25	7
15	15	+10/–8	+3/–11	32	0/–9	+3/–14	20	26	17,7	0,5	80	25	7
17	17	+10/–8	+3/–11	35	0/–9	+3/–14	22	28	20,2	0,5	100	25	7
20	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 bore code	**Tolerances**						**Static limit loads**		**Diagonal clearance**	**Increased radial clearance**	**Maximum starting torque**	
	Kea max Standard	Precision	Sia max Standard	Precision	Sea max Standard	Precision	Radial C_s	Axial C_a			Shielded	Sealed
–	µm						kN		µm		mNm	
8	40	10	40	15	40	20	24	10,9	50/ 250	7/ 15	4	6
10	40	10	40	15	40	20	34,4	15,6	50/ 250	7/ 15	6	9
12	40	10	40	15	40	20	40,4	18,4	50/ 250	7/ 15	7	11
15	40	10	40	15	40	20	47	21,4	50/ 250	7/ 15	9	14
17	40	10	40	15	40	20	53,8	24,5	50/ 250	7/ 15	11	17
20	40	10	40	20	40	20	83	37,7	50/ 250	7/ 15	15	23

Designation system

Examples: ZWAGN20EDJ7-15G81CP55R10
AGN8

Z W AGN 20 E D J7-15 G81 CP55 R10

Surface treatment

No code	Not plated steel
Z	Cadmium plated steel
SZ[1]	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[1]	Precision

Radial clearance

No code	Standard clearance
J7-15[1]	Increased clearance

Lubrication

No code	Grease G354
G81	Grease G395

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

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

---

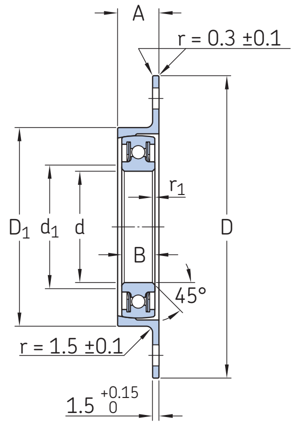
[1] SKF option

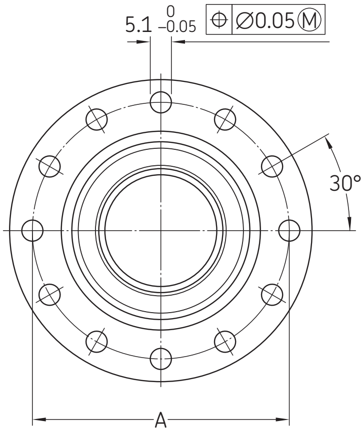
[2] SKF option, available only for corrosion-resistant steel material without other surface treatment

1.7 Deep groove ball bearing with self-aligning ring single row, EN 3059, EN 3060, EN 3061 (Metric dimensions)

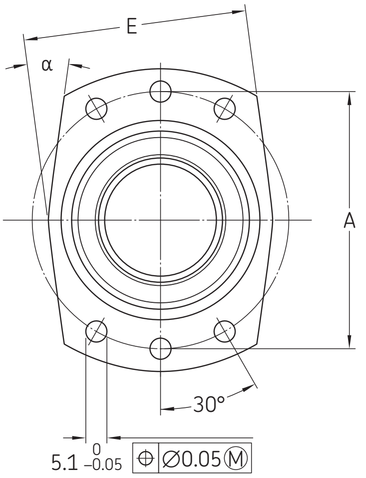
TRCE..

Technical specification	EN 3727
Product standard Standard tolerances:	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)





Standard circular profile



C optional profile

Dimensions

Nominal bore code	Dimensions d	Δdmp (J7)	Δds	D ±0,2	C 0 −0,12	B ±0.15	d_1 ±0.05	A	r_1 +0,3 −0,2	E ± 1	α ± 1°	Mass Standard circular profile ≈	C optional profile ≈
–	mm	µm		mm							°	g	
16	16	0/–8	–8	58	6	8	33	47	0,5	36	0	47	38
20	20	0/–10	+3/–13	63	7	9	38	52	0,5	42	14	62	50
25	25	0/–10	+3/–13	68	7	9	43	57	0,5	46	14	70	58
32	32	0/–12	+3/–15	77	7	9	52	66	0,5	55	24	94	78
35	35	0/–12	+3/–15	80	7	9	55	69	0,5	58	24	100	86
40	40	0/–12	+3/–15	86	8	10	61	75	0,5	64	30	125	104
45	45	0/–12	+3/–15	91	8	10	66	80	0,5	68	30	137	114
50	50	0/–12	+3/–15	97	8	10	72	86	0,5	74	30	155	129
63	63	0/–13	+4/–19	111	9	11	86	100	0,5	90	44	210	178

Loads, clearance and torque

Nominal bore code	Static limit load Radial C_s	Clearances Radial Bearing in bearing steel	Bearing in corrosion-resistant steel	Axial max between outer and inner rings	Maximum starting torque Shielded	Sealed	Swivelling torque Standard	Reduced
–	kN	µm			mNm		Nm	
16	15,2	2/7	3/11	120	8	12	2/7	0,8/3
20	18,7	2/7	5/13	120	9	14	3/8	0,8/3
25	20,6	2/7	5/13	120	12	21	4/9	0,8/3
32	24,5	2/7	5/13	120	21	30	5/10	1/4
35	25,5	2/9	5/13	120	27	35	5/11	1/4
40	29,5	2/9	5/13	120	33	44	8/14	1,3/4,5
45	32,4	2/9	5/13	120	39	53	9/15	1,3/4,5
50	35,3	2/9	5/13	120	48	68	9/18	1,5/5
63	39,2	2/9	5/13	120	83	113	10/20	2/6

Designation system

Examples: XTRCE20TCDN741R10
SWATRCE16E

X TRCE 20 T C D N741 R10

Prefix code – **Material and surface treatment**

	Ball bearing		**Self-aligning ring**
No code	Bearing steel	–	Cadmium plated steel
Z	Bearing steel	Cadmium plated	Cadmium plated steel
S1)	Bearing steel	–	Zinc-nickel plated steel
SZ1)	Bearing steel	Zinc-nickel plated	Zinc-nickel plated steel
WA1)	Corrosion-resistant steel	–	Cadmium plated steel
SWA1)	Corrosion-resistant steel	–	Zinc-nickel plated steel
X	Corrosion-resistant steel	–	Corrosion-resistant steel

Basic designation

Bore code

Shield and seal

T	Shielded
E	Sealed

Flange profile

No code	Standard circular profile
C	Optional profile

Tolerances

No code	Standard
D1)	Precision

Variation

	Lubricant	**Swivelling torque**
No code1)	G354	Standard
N741	G354	Reduced
N811	G395	Reduced

Oversize

No code	Standard outer diameter size
R10	0,1 mm oversized outer diameter1)
R20	0,2 mm oversized outer diameter1)

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1) SKF option

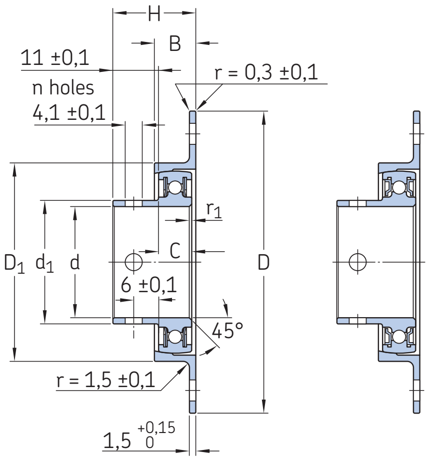
Tolerances

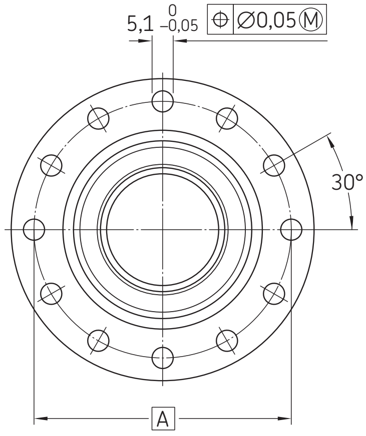
Nominal bore code	**Tolerances** Kia max Standard Without self-aligning ring	 Precision	Kea max Standard	Precision	Sia max Standard	Precision	Sea max Standard	Precision
–	µm							
16	25	7	40	10	40	15	40	20
20	25	8	40	10	40	20	40	20
25	25	8	40	10	40	20	40	20
32	25	10	40	10	40	20	40	20
35	25	10	40	10	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

1.8 Deep groove ball bearing with self-aligning ring single row, EN 4041 (Metric dimensions)

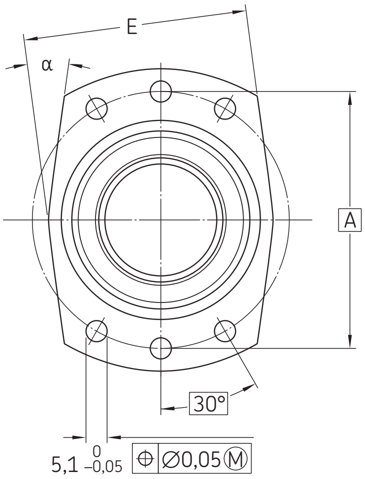
TRCEI..

Technical specification	EN 3727
Product standard	EN 4041





Standard circular profile



C optional profile

Dimensions

Nominal bore code	Dimensions d	Δdmp	Δds	D ±0,2	C 0 −0,12	B ±0.15	d_1 0 −0,1	A	H ±0,15	D_1 ± 0.05	n	r_1 +0,3 −0,2	E ± 1	α ± 1°
–	mm	µm		mm										°
32	32	0/–12	+3/–15	77	7	9	35	66	19	52	4	0,5	55	24
35	35	0/–12	+3/–15	80	7	9	38	69	19	55	4	0,5	58	24
40	40	0/–12	+3/–15	86	8	10	43	75	20	61	4	0,5	64	30
45	45	0/–12	+3/–15	91	8	10	48	80	20	66	4	0,5	68	30
50	50	0/–12	+3/–15	97	8	10	53	86	20	72	6	0,5	74	30
63	63	0/–15	+4/–19	111	9	11	67	100	21	86	6	0,5	90	44

Loads, clearance and torque

Nominal bore code	Mass Standard circular profile ≈	C optional profile ≈	Static limit load Radial C_s	Clearances Radial	Axial max between outer and inner rings	Maximum starting torque Shielded	Sealed	Swivelling torque Standard	Reduced
–	g		kN	µm		mNm		Nm	
32	107	91	24,5	2/7	120	21	30	5/10	1/4
35	125	97	25,5	2/9	120	27	35	5/11	1/4
40	143	121	29,5	2/9	120	33	44	8/14	1,3/4,5
45	155	136	32,4	2/9	120	39	53	9/15	1,3/4,5
50	175	152	35,3	2/9	120	48	68	9/18	1,5/5
63	235	205	39,2	2/9	120	83	113	10/20	2/6

Designation system

Examples: XTRCEI40TCDN741R10
SWATRCEI32E

X	TRCEI	40	T	C	D	N741	R10

Prefix code	**Material and surface treatment** **Ball Bearing**	**Flanged self aligning ring**
No code1)	Cadmium plated bearing steel	Cadmium plated steel
S1)	Zinc-nickel plated bearing steel	Zinc-nickel plated steel
WA1)	Corrosion-resistant steel	Cadmium plated steel
SWA1)	Corrosion-resistant steel	Zinc-nickel plated steel
X	Corrosion-resistant steel	Corrosion-resistant steel

Basic designation

Bore code

Shield and seal

T	Shielded
E	Sealed

Flange profile

No code	Standard circular profile
C	Optional profile

Tolerances

No code	Standard
D1)	Precision

Variation

	Lubricant	**Swivelling torque**
No code1)	G354	Standard
N741	G354	Reduced
N811	G395	Reduced

Oversize

No code	Standard outer diameter size
R10	0,1 mm oversized outer diameter1)
R20	0,2 mm oversized outer diameter1)

---

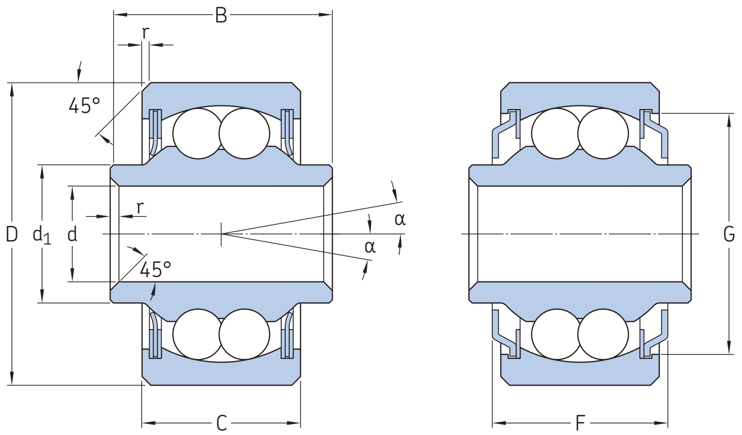
1) SKF option

Tolerances

Nominal bore code	**Tolerances** Kia max Standard	 Precision	 Kea max Standard	 Precision	 Sia max Standard	 Precision	 Sea max Standard	 Precision
	Without self-aligning ring							
–	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, EN 3287, EN 3288, EN 3289 (Metric dimensions)

KN..



Technical specification	EN 3280
Product standard	
Standard tolerances:	EN 3287 (Bearing steel) EN 3288 (Bearing steel cadmium plated) EN 3289 (Corrosion-resistant steel)

Dimensions

Nominal bore code		**Dimensions**													**Mass**
Shielded	Sealed	d	Δdmp (J7)	Δds	D	ΔDmp	ΔDs	C 0 –0,12	B 0 –0,12	d_1 ≈	F max	G max	r +0.3 -0.2	α	≈
–		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 Standard	Precision	Kea max Standard	Precision	Radial C_s	Axial C_a	Shielded	Sealed	
–		µm				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
KN6N745

Z W KN 10 E D N743 CP55 R10

Surface treatment

No code	Not plated steel
Z	Cadmium plated steel
SZ1)	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
D1)	Precision

Variation

	Lubricant	Clearances
J6-12 (for bore code <= 6)1)	G354	Increased
J8-14 (for bore code 8 to 15)1)	G354	Increased
J10-17 (for bore code >= 17)1)	G354	Increased
J6-12G81 (for bore code <= 6)1)	G395	Increased
J8-14G81 (for bore code 8 to 15)1)	G395	Increased
J10-17G81 (for bore code >= 17)1)	G395	Increased
N7452)	G354	Reduced
N815	G395	Reduced
N8133)	G395	Standard
N7434)	G354	Standard
N7465)	G354	Group 3
N8166)	G395	Group 3

Passivation

No code	Not treated
CP557)	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

---

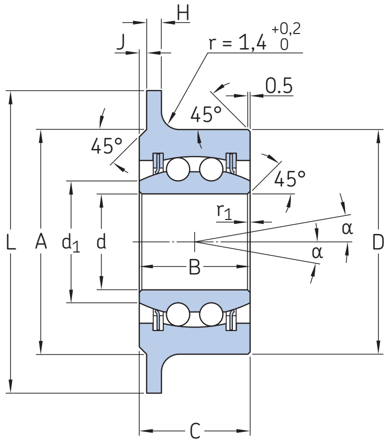
1) SKF option
2) Replaces no code, 3) Replaces N741, 4) Replaces N741, 5) Replaces N742, 6) Replaces N812
7) SKF option, available only for corrosion-resistant steel material without other surface treatment

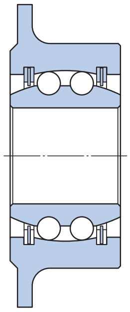
Clearance

Nominal bore code		Clearances						
Shielded	Sealed	Standard Radial	Axial max	Reduced Radial	Axial max	Group 3 Radial	Axial max	Increased Radial
–		µm						
5	**5**	2/13	100	2/6	70	10/20	100	6/12
6	**6**	2/13	100	2/6	70	10/20	100	6/12
8/24	**8**	2/13	100	2/7	80	10/20	100	8/14
10	**10**	2/13	120	2/7	80	10/20	120	8/14
12	**12**	3/18	120	3/9	80	13/23	120	8/14
15	**15**	3/18	120	3/9	80	13/23	120	8/14
17	**17**	3/18	160	3/9	80	13/23	160	10/17
20	**20**	5/20	180	5/10	80	15/25	180	10/17

1.10 Self-aligning ball bearing double row, EN 4034 (Metric dimensions)

KNRCE..





Technical specification	EN 3280
Product standard	EN 4034

Dimensions and tolerances

Nominal bore code	**Dimensions** d	Δdmp (J7)	Δds	D	ΔDmp	ΔDs	C 0 −0,12	B 0 −0,12	d_1 ≈	A ≈	L ≈	J ≈	H	r1 +0,3 0	α	**Mass** ≈
–	mm	µm		mm	µm		mm								°	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[1]	35	0/–11	+3/–15	55	0/–15	+4/–17	14	14	40,6	58	63	2	2	0,2	2°30'	141
40[1]	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** Kia max Standard	Precision	Kea max Standard	Precision	**Static limit loads** Radial C_s	Axial C_a	**Radial clearance**	**Maximum starting torque** Shielded	Sealed	**Maximum swivelling torque**
–	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[1]	25	10	40	10	29,1	5,3	10/18	44	66	0,15
40[1]	25	10	40	10	32,5	5,3	10/18	50	75	0,15

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[1] SKF option

Designation system

Examples: ZWKNRCE20EDN743R10
KNRCE15N813

Z W KNRCE 20 E D N743 R10

Surface treatment

No code	Not plated steel
Z[1]	Cadmium plated steel
SZ[1]	Zinc-nickel plated steel

Material

No code[1]	Bearing steel
W	Corrosion-resistant steel

Basic designation

Bore code

Shield and seal

No code	Shielded
E	Sealed

Tolerances

No code	Standard
D[1]	Precision

Variation

	Lubricant
N743[2]	G354
N813	G395

Oversize

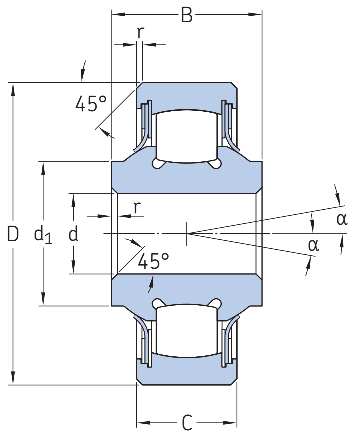
No code	Standard outer diameter size
R10[1]	0,1 mm oversized outer diameter
R20[1]	0,2 mm oversized outer diameter

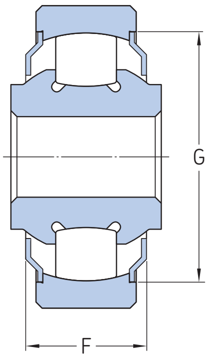
---

[1] SKF option
[2] Replaces no code

1.11 Spherical roller bearing single row, EN 3053, EN 3054, EN 3055 (Metric dimensions)

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





Technical specification	EN 3280
Product standard Standard tolerances:	EN 3053 (Bearing steel) EN 3054 (Bearing steel cadmium plated) EN 3055 (Corrosion-resistant steel)

Dimensions

Nominal bore code Shielded	Sealed	**Dimensions** d	Δdmp Standard	Δds	D	ΔDmp Standard	ΔDs	C 0 –0,12	B 0 –0,12	d_1 ≈	F max	G max	r +0,3 –0,2	α Shielded	Sealed
		mm	µm		mm	µm		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
N8	**N8FE..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 Shielded	Sealed	**Mass** ≈	**Tolerances** Kia max Standard	Precision	Kea max Standard	Precision	**Static limit loads** Radial C_s	Axial C_a	**Clearances** Radial	Axial max	**Maximum starting torque**
		g	µm				kN		µm		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
N8	**N8FE..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
KN8FN743

Z W K 10 F E D SP1 CP55 R10

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Material

No code	Bearing steel inner ring and outer ring
W	Corrosion-resistant steel inner ring and outer ring

Basic designation

Bore code

Tolerances

No code	Standard
D1)	Precision

Variation

	Shield and seal	Lubricant
N7432)	Shielded	G354
N813	Shielded	G395
E..SP11)4)	Sealed	G354
E..SP1G811)4)	Sealed	G395

Passivation

No code	Not treated
CP553)	Passivated corrosion-resistant steel

Oversize

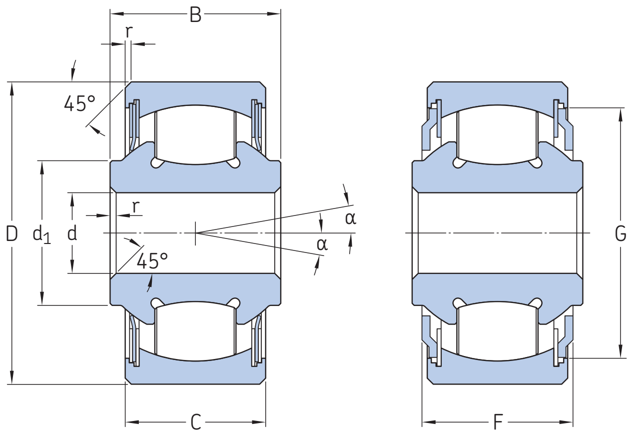
No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

---

1) SKF option
2) Replaces no code,
3) SKF option, available only for corrosion-resistant steel material without other surface treatment
4) Only available for bore code 8 and N8

1.12 Spherical roller bearing single row, EN 3290, EN 3291, EN 3292 (Metric dimensions)

KNA..F



Technical specification	EN 3280
Product standard	
Standard tolerances:	EN 3290 (Bearing steel) EN 3291 (Bearing steel cadmium plated) EN 3292 (Corrosion-resistant steel)

Dimensions

Nominal bore code	**Dimensions** d	Δdmp Standard	Δds	D	ΔDmp Standard	ΔDs	C 0 −0,12	B 0 −0,12	d_1 ≈	F max	G max	r +0,3 −0,2	α	**Mass** ≈
–	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 bore code	**Tolerances** Kia max Standard	Precision	Kea max Standard	Precision	**Static limit loads** Radial C_s	Axial C_a	**Clearances** Standard Radial	Axial	Reduced Radial	Axial	**Maximum starting torque** 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
KNA8FN813

Z W KNA 10 F E D N743 CP55 R10

Surface treatment

No code	Not plated steel
Z	Cadmium plated steel
SZ[1]	Zinc-nickel plated steel

Material

No code	Carbon chrome steel
W	Corrosion-resistant steel

Basic designation

Bore code

Shield and seal

No code	Shielded
E	Sealed

Tolerances

No code	Standard
D[1]	Precision

Variation

	Lubricant	**Clearances**
N745[2]	G354	Reduced
N815	G395	Reduced
N813[3]	G395	Standard
N743[4]	G354	Standard

Passivation

No code	Not treated
CP55[5]	Passivated corrosion-resistant steel

Oversize

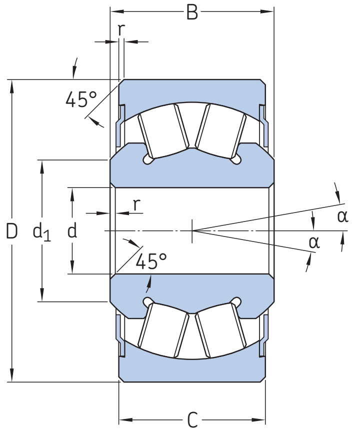
No code	Standard outer diameter size
R10[1]	0,1 mm oversized outer diameter
R20[1]	0,2 mm oversized outer diameter

---

[1] SKF option
[2] Replaces no code
[3] Replaces N811
[4] Replaces N741
[5] 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** d	Δdmp (J7)	Δds	D	ΔDmp	ΔDs	C 0 −0,12	B 0 −0,12	d_1 ≈	r +0,3 −0,2	α	**Mass** ≈
–	mm	µm		mm	µm		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** Kia max Standard	Kea max Standard	**Static limit loads** Radial C_s	Axial C_a	**Axial clearance**	**Maximum starting torque**
–	µm		kN		µm	mNm
8	25	40	54,3	16,3	0/300	30
10	25	40	54,3	16,3	0/300	30
12	25	40	54,3	16,3	0/300	30

Designation system

Examples: ZWK10/21DG81CP55R10
K10D

Z W **K** 10/21 **D** G81 CP55 R10

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[1]	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

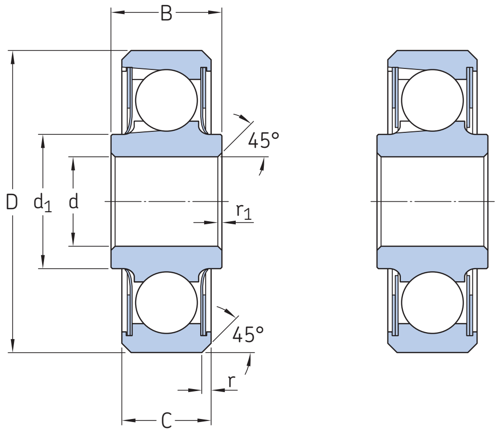
---

[1] Available only for corrosion-resistant steel material without other surface treatment

1.14 Deep groove ball bearing single row, AS 27640 (Inch dimensions)

KP.., KP..L

Technical specification	AS 7949
Product standard	AS 27640



Dimensions

Nominal bore code	Dimensions d	Δdmp Standard	SKF super precision	Δds	D	ΔDmp Standard	SKF super precision	ΔDs	C	ΔCs Standard	SKF super precision
–	in/*mm*										
3L	0.1900 *4,826*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.6250 *15,875*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0,203 *5,156*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
3	0.1900 *4,826*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.7774 *19,745*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.270 *6,858*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
4	0.2500 *6,350*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.9014 *22,895*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.335 *8,509*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
5	0.3125 *7,937*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.2500 *31,750*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
6	0.3750 *9,525*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.4375 *36,512*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.469 *11,912*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
8	0.5000 *12,700*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.6875 *42,862*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.500 *12,700*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
10	0.6250 *15,875*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.9375 *49,212*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.500 *12,700*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	Dimensions B	ΔBs Standard	SKF super precision	d_1 ≈	r_1 +0.015 *+0,381*	r +0.015 *+0,381*	Mass ≈	Tolerances Kia max Standard	SKF super precision	Kea max Standard	SKF super precision	Sia max Standard	SKF super precision
–	in/*mm*						lb/*g*	in/*mm*					
3L	0.245 *6,223*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.280 *7,112*	0.005 *0,127*	0.010 *0,254*	0.01 *4,5*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
3	0.297 *7,543*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.331 *8,407*	0.005 *0,127*	0.022 *0,559*	0.03 *14*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
4	0.484 *12,293*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.390 *9,906*	0.005 *0,127*	0.032 *0,813*	0.04 *18*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
5	0.558 *14,173*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.469 *11,912*	0.015 *0,381*	0.032 *0,813*	0.09 *41*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
6	0.620 *15,748*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.591 *15,011*	0.015 *0,381*	0.032 *0,813*	0.15 *68*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
8	0.620 *15,748*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.768 *19,507*	0.015 *0,381*	0.044 *1,118*	0.21 *95*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
10	0.620 *15,748*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0. 850 *21,590*	0.015 *0,381*	0.044 *1,118*	0.28 *127*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*

Designation system

Examples: ZWMKP10SK2CP55RP01
KP3LP

ZW M KP 10 SK2 CP55 RP01

Material and surface treatment

No code	Cadmium plated bearing steel
W1)	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW1)	Cadmium plated corrosion-resistant steel
SZW1)	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M1)	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version	Radial clearance KP..	 MKP..1)
SK2	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R	G395	Sealed	Reduced	–
SK2.R	G354	Sealed	Reduced	–
P1)	G354	Shielded	Standard	Reduced
PG811)	G395	Shielded	Standard	Reduced
PG81.R1)	G395	Shielded	Reduced	–
P.R1)	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP552)	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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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 Sea max Standard	SKF super precision	Static limit loads Radial C_s	Axial Ca	Radial dynamic load rating3)4) Load fixed with respect to outer ring	inner ring	Radial clearance Standard	Reduced	Maximum starting torque5) Shielded	Sealed
–	in/*mm*		lbf/*kN*		lbf/*kN*		in/*mm*		oz-in/*mNm*	
3L	0.0016 *0,0406*	0.0010 *0,0254*	1 560 *6,94*	700 *3,10*	1 520 *6,76*	1 260 *5,60*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.67 *4,71*	1 *7,06*
3	0.0016 *0,0406*	0.0010 *0,0254*	1 880 *8,36*	900 *3,99*	1 700 *7,56*	1 450 *6,45*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.67 *4,71*	1 *7,06*
4	0.0016 *0,0406*	0.0010 *0,0254*	2 680 *11,92*	1 200 *5,34*	2 410 *10,72*	2 030 *9,03*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.67 *4,71*	1 *7,06*
5	0.0016 *0,0406*	0.0010 *0,0254*	5 620 *25,00*	2 500 *11,12*	4 900 *21,8*	3 970 *17,66*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.67 *4,71*	1 *7,06*
6	0.0016 *0,0406*	0.0010 *0,0254*	7 910 *35,18*	3 500 *15,57*	6 540 *29,09*	5 410 *24,06*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	1.33 *9,41*	2 *14,12*
8	0.0016 *0,0406*	0.0010 *0,0254*	11 800 *52,49*	5 200 *23,13*	9 320 *41,46*	7 700 *34,25*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	2 *14,12*	4 *28,25*
10	0.0016 *0,0406*	0.0010 *0,0254*	14 100 *62,72*	6 200 *27,58*	11 000 *48,93*	9 060 *40,3*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	2 *14,12*	4 *28,25*

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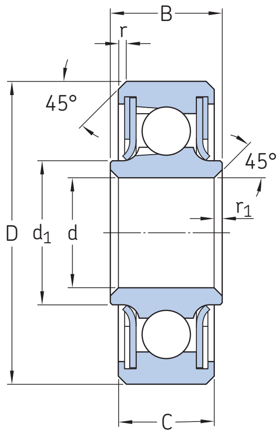
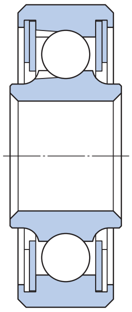
3) For average life of 10 000 complete 90° cycles
4) If G395 load rating is 20% lower
5) Values are valid for bearings with G395. When using G354, values are 20% higher

1.15 Deep groove ball bearing single row, AS 27641 (Inch dimensions)

KP..A bore code **3** to **8**

Technical specification	AS 7949
Product standard	AS 27641





Dimensions

Nominal bore code	Dimensions d	Δdmp Standard	Δdmp SKF super precision	Δds	D	ΔDmp Standard	ΔDmp SKF super precision	ΔDs	C	ΔCs Standard	ΔCs SKF super precision
–	in/*mm*										
3	0.1900	0/–0.0005	0/–0.0003	+0.0002/–0.0007	0.6250	0/–0.0005	0/–0.0004	+0.0005/–0.0010	0.234	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*	*5,943*	*0/–0,127*	*0/–0,127*
4	0.2500	0/–0.0005	0/–0.0003	+0.0002/–0.0007	0.7500	0/–0.0005	0/–0.0004	+0.0005/–0.0010	0.219	0/–0.005	0/–0.005
	6,350	*0/–0,0127*	*0/–0,0076*	*+0,0050/–0,0178*	*19,050*	*0/–0,0127*	*0/–0,0101*	*+0,0127/–0,0254*	*5,562*	*0/–0,127*	*0/–0,127*
5	0.3125	0/–0.0005	0/–0.0003	+0.0002/–0.0007	0.8125	0/–0.0005	0/–0.0004	+0.0005/–0.0010	0.234	0/–0.005	0/–0.005
	7,937	*0/–0,0127*	*0/–0,0076*	*+0,0050/–0,0178*	*20,637*	*0/–0,0127*	*0/–0,0101*	*+0,0127/–0,0254*	*5,943*	*0/–0,127*	*0/–0,127*
6	0.3750	0/–0.0005	0/–0.0003	+0.0002/–0.0007	0.8750	0/–0.0005	0/–0.0004	+0.0005/–0.0010	0.250	0/–0.005	0/–0.005
	9,525	*0/–0,0127*	*0/–0,0076*	*+0,0050/–0,0178*	*22,225*	*0/–0,0127*	*0/–0,0101*	*+0,0127/–0,0254*	*6,350*	*0/–0,127*	*0/–0,127*
8	0,5000	0/–0.0005	0/–0.0003	+0.0002/–0.0007	1.1250	0/–0.0005	0/–0.0004	+0.0005/–0.0010	0.313	0/–0.005	0/–0.005
	12,700	*0/–0,0127*	*0/–0,0076*	*+0,0050/–0,0178*	*28,575*	*0/–0,0127*	*0/–0,0101*	*+0,0127/–0,0254*	*7,950*	*0/–0,127*	*0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	Dimensions						Mass	Tolerances					
	B	ΔBs Standard	SKF super precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	≈	Kia max Standard	SKF super precision	Kea max Standard	SKF super precision	Sia max Standard	SKF super precision
–	in/*mm*						lb/*g*	in/*mm*					
3	0.297	0/–0.005	0/–0.0025	0.297	0.005	0.016	0,01	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	7,543	*0/–0,127*	*0/–0,0635*	*7,543*	*0,127*	*0,406*	*4,5*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
4	0.281	0/–0.005	0/–0.0025	0.380	0.005	0.016	0,02	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	7,137	*0/–0,127*	*0/–0,0635*	*9,652*	*0,127*	*0,406*	*9*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
5	0.297	0/–0.005	0/–0.0025	0.415	0.015	0.016	0,02	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	7,543	*0/–0,127*	*0/–0,0635*	*10,541*	*0,381*	*0,406*	*9*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
6	0.313	0/–0.005	0/–0.0025	0.495	0.015	0.016	0,03	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	7,950	*0/–0,127*	*0/–0,0635*	*12,573*	*0,381*	*0,406*	*14*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
8	0.375	0/–0.005	0/–0.0025	0.616	0.015	0.016	0,05	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	9,525	*0/–0,127*	*0/–0,0635*	*15,646*	*0,381*	*0,406*	*22,6*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*

Designation system

Examples:	ZWMKP10ASK2CP55RP01 KP8AP	ZW	M	KP	10	A	SK2	CP55	RP01

Material and surface treatment

No code	Cadmium plated bearing steel
W[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M[1]	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version	Radial clearance	
			KP..	**MKP..**[1]
SK2	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R	G395	Sealed	Reduced	–
SK2.R	G354	Sealed	Reduced	–
P[1]	G354	Shielded	Standard	Reduced
PG81[1]	G395	Shielded	Standard	Reduced
PG81.R[1]	G395	Shielded	Reduced	–
P.R[1]	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[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** Sea max Standard	SKF super precision	**Static limit loads** Radial C_s	Axial C_a	**Radial dynamic load rating**[3][4] Load fixed with respect to outer ring	inner ring	**Radial clearance** Standard	Reduced	**Maximum starting torque**[5] Shielded	Sealed
–	in/*mm*		lbf/*kN*		lbf/*kN*		in/*mm*		oz-in/*mNm*	
3	0.0016 *0,0406*	0.0010 *0,0254*	1 560 *6,94*	700 *3,10*	1 500 *6,67*	1 250 *5,56*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.67 *4,73*	1 *7,06*
4	0.0016 *0,0406*	0.0010 *0,0254*	1 880 *8,36*	900 *3,99*	1 690 *7,52*	1 450 *6,45*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	1 *7,06*	1.5 *10.59*
5	0.0016 *0,0406*	0.0010 *0,0254*	2 190 *9,74*	1 000 *4,45*	1 820 *8,10*	1 600 *7,12*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	1 *7,06*	1.5 *10.59*
6	0.0016 *0,0406*	0.0010 *0,0254*	2 500 *11,12*	1 100 *4,89*	1 920 *8,54*	1 710 *7,61*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	1.33 *9.41*	2 *14.12*
8	0.0016 *0,0406*	0.0010 *0,0254*	3 910 *17,39*	1 700 *7,56*	2 870 *12,77*	2 550 *11,34*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	1.67 *11.77*	2.5 *17.65*

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[3] For average life of 10 000 complete 90° cycles

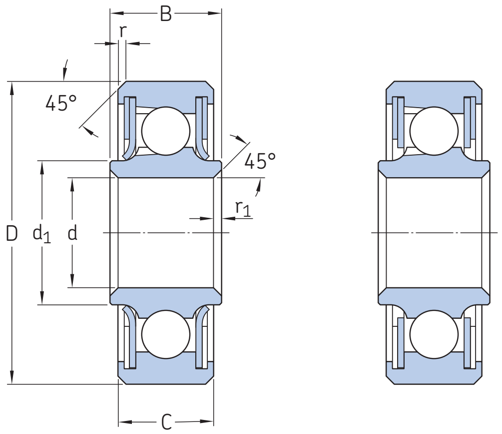
[4] If G395 load rating is 20% lower

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

1.15 Deep groove ball bearing single row, AS 27641 (Inch dimensions)

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

Technical specification	AS 7949
Product standard	AS 27641



Dimensions

Nominal bore code	Dimensions										
	d	Δdmp Standard	SKF super precision	Δds	D	ΔDmp Standard	SKF super precision	ΔDs	C	ΔCs Standard	SKF super precision
–	in/*mm*										
10	0,6250 *15,875*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1,3750 *34,925*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0,344 *8,737*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
12	0,7500 *19,050*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1,6250 *41,275*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0,375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
16	1,0000 *25,400*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	2,0000 *50,800*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0,438 *11,125*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
20	1,2500 *31,750*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	2,2500 *57,150*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0,438 *11,125*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	Dimensions						Mass	Tolerances					
	B	ΔBs Standard	SKF super precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	≈	Kia max Standard	SKF super precision	Kea max Standard	SKF super precision	Sia max Standard	SKF super precision
–	in/*mm*						lb/*g*	in/*mm*					
10	0,406 *10,312*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0,768 *19,507*	0,015 *0,381*	0,032 *0,813*	0,08 *36*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
12	0,437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0,919 *23,342*	0,015 *0,381*	0,032 *0,813*	0,13 *59*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
16	0,500 *12,700*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1,241 *31,521*	0,015 *0,381*	0,032 *0,813*	0,22 *100*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
20	0,500 *12,700*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1,478 *37,541*	0,015 *0,381*	0,032 *0,813*	0,26 *118*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*

Designation system

Examples: ZWMKP10ASK2CP55RP01
KP8AP

ZW M KP 10 A SK2 CP55 RP01

Material and surface treatment

No code	Cadmium plated bearing steel
W1)	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW1)	Cadmium plated corrosion-resistant steel
SZW1)	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M1)	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version	Radial clearance	
			KP..	MKP..1)
SK2	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R	G395	Sealed	Reduced	–
SK2.R	G354	Sealed	Reduced	–
P1)	G354	Shielded	Standard	Reduced
PG811)	G395	Shielded	Standard	Reduced
PG81.R1)	G395	Shielded	Reduced	–
P.R1)	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP552)	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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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 Sea max Standard	 SKF super precision	Static limit loads Radial C_s	 Axial C_a	Radial dynamic load rating3)4) Load fixed with respect to outer ring	 inner ring	Radial clearance Standard	 Reduced	Maximum starting torque5) Shielded	 Sealed
–	in/*mm*		lbf/*kN*		lbf/*kN*		in/*mm*		oz-in/*mNm*	
10	0.0016 *0,0406*	0.0010 *0,0254*	6 700 *29,82*	3 000 *13,35*	4 980 *22,15*	4 360 *19,39*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	2 *14.12*	3 *21,18*
12	0.0016 *0,0406*	0.0010 *0,0254*	8 790 *39,12*	3 900 *17,35*	5 980 *26,60*	5 320 *23,66*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	2 *14.12*	3 *21,18*
16	0.0016 *0,0406*	0.0010 *0,0254*	11 900 *52,93*	5 200 *23,14*	7 070 *31,45*	6 400 *28,47*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	2.67 *18.83*	4 *28.25*
20	0.0016 *0,0406*	0.0010 *0,0254*	13 800 *61,41*	6 100 *27,13*	7 400 *32,92*	6 810 *30,29*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	3.33 *23.53*	5 *35.31*

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3) For average life of 10 000 complete 90° cycles

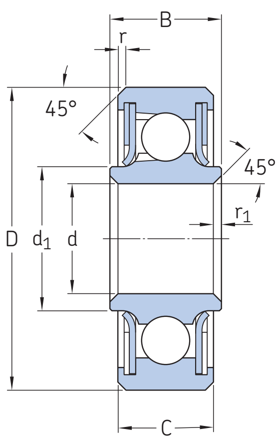
4) If G395 load rating is 20% lower

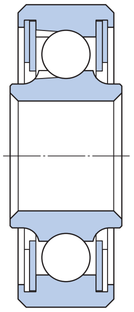
5) Values are valid for bearings with G395. When using G354, values are 20% higher

1.16 Deep groove ball bearing single row, AS 27642 (Inch dimensions)

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

Technical specification	AS 7949
Product standard	AS 27642





Dimensions

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

Dimensions cont. and tolerances

Nominal bore code	Dimensions C	ΔCs Standard	Precision	B	ΔBs Standard	Precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	Mass ≈	Tolerances Kia max Standard	Precision	Kea max Standard	Precision
–	in/*mm*									lb/*g*	in/*mm*			
16	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/ –0,127*	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.141 *28,981*	0.0240 *0,610*	0.0240 *0,610*	0.14 *64*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
21	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.454 *36,931*	0.0240 *0,610*	0.0240 *0,610*	0.16 *73*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
23	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.574 *39,979*	0.0240 *0,610*	0.0240 *0,610*	0.17 *77*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
25	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.693 *43,002*	0.0240 *0,838*	0.0240 *0,838*	0.19 *86*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
29	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.931 *49,047*	0.0240 *0,610*	0.0240 *0,610*	0.21 *95*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
33	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	2.231 *56,667*	0.0240 *0,610*	0.0240 *0,610*	0.23 *104*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
37	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	2.468 *62,687*	0.0240 *0,610*	0.0240 *0,610*	0.26 *118*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *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[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M[1]	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version	Radial clearance	
			KP..	MKP..
SK2	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R[1]	G395	Sealed	Reduced	–
SK2.R[1]	G354	Sealed	Reduced	–
P[1]	G354	Shielded	Standard	Reduced
PG81[1]	G395	Shielded	Standard	Reduced
PG81.R[1]	G395	Shielded	Reduced	–
P.R[1]	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[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[3][4]		Radial clearance		Maximum starting torque[5]	
	Sia max		Sea max		Radial	Axial	Load fixed with respect to		Standard	Reduced	Shielded	Sealed
	Standard	Precision	Standard	Precision	C_s	C_a	outer ring	inner ring				
–	in/*mm*				lbf/*kN*		lbf/*kN*		in/*mm*		oz-in/*mNm*	
16	0.0010	0.0008	0 .0016	0.0010	8 085	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*	*35,98*	*16,02*	*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*	*43,78*	*19,58*	*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	8
	0,0254	*0,0203*	*0,0406*	*0,0254*	*46,72*	*20,91*	*20,68*	*19,39*	*0,0076/ 0,0254*	*0,0025/ 0,0127*	*37,65*	*56,48*
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*	*22,25*	*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*	*56,51*	*24,92*	*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*	*28,48*	*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*	*31,15*	*21,71*	*20,86*	*0,0076/ 0,0254*	*0,0025/ 0,0127*	*80,01*	*141,23*

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[3] For average life of 10 000 complete 90° cycles

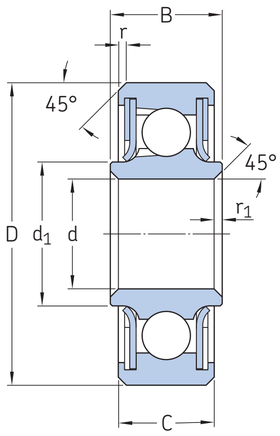
[4] If G395 load rating is 20% lower

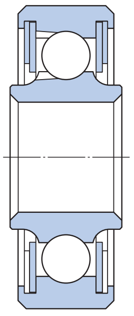
[5] Values are valid for bearings with G395. When using G354, values are 20% higher

1.16 Deep groove ball bearing single row, AS 27642 (Inch dimensions)

KP..B bore code **47** to **68**

Technical specification	AS 7949
Product standard	AS 27642





Dimensions

Nominal bore code	Dimensions d	Δdmp Standard	Precision	Δds Standard	Precision	D	ΔDmp Standard	Precision	ΔDs
–	in/*mm*								
47	2.9380 *74,625*	0/–0.0010 *0/–0,0254*	–0.0005/–0.0010 *–0,0127/–0,0254*	+0.0008/–0.0008 *+0,0203/–0,0203*	+0.0003/–0.0008 *+0,0076/–0,0203*	3.8750 *98,425*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0010/–0.0020 *+0,0254/–0,0508*
49	3.0630 *77,800*	0/–0.0010 *0/–0,0254*	–0.0005/–0.0010 *–0,0127/–0,0254*	+0.0008/–0.0008 *+0,0203/–0,0203*	+0.0003/–0.0008 *+0,0076/–0,0203*	4.0000 *101,600*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0010/–0.0020 *+0,0254/–0,0508*
52	3.2500 *82,550*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0005/–0.0015 *+0,0127/–0,0381*	+0.0003/–0.0013 *+0,0076/–0,0330*	4.1875 *106,363*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0010/–0.0020 *+0,0254/–0,0508*
56	3.5000 *88,900*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0005/–0.0015 *+0,0127/–0,0381*	+0.0003/–0.0013 *+0,0076/–0,0330*	4.4375 *112,713*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0010/–0.0020 *+0,0254/–0,0508*
60	3.7500 *95,250*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0005/–0.0015 *+0,0127/–0,0381*	+0.0003/–0.0013 *+0,0076/–0,0330*	4.6875 *119,063*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0010/–0.0020 *+0,0254/–0,0508*
64	4.0000 *101,600*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0005/–0.0015 *+0,0127/–0,0381*	+0.0003/–0.0013 *+0,0076/–0,0330*	4.9375 *125,413*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0010/–0.0020 *+0,0254/–0,0508*
68	4.2500 *107,950*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0005/–0.0015 *+0,0127/–0,0381*	+0.0003/–0.0013 *+0,0076/–0,0330*	5.3125 *134,938*	0/–0.0010 *0/–0,0254*	0/–0.0010 *0/–0,0254*	+0.0010/–0.0020 *+0,0254/–0,0508*

Dimensions cont. and tolerances

Nominal bore code	Dimensions C	ΔCs Standard	Precision	B	ΔBs Standard	Precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	Mass ≈	Tolerances Kia max Standard	Precision	Kea max Standard	Precision
–	in/*mm*									lb/*g*	in/*mm*			
47	0.469 *11,912*	0/–0.005 *0/–0,127*	0/–0.005 *0/ –0,127*	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	3.093 *78,562*	0.039 *0,991*	0.039 *0,991*	0.49 *222*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
49	0.469 *11,913*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	3.222 *81,838*	0.039 *0,991*	0.039 *0,991*	0.53 *240*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
52	0.469 *11,913*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	3.479 *88,367*	0.039 *0,991*	0.039 *0,991*	0.55 *249*	0.0012 *0,0305*	0.0012 *0,0305*	0.0016 *0,0406*	0.0016 *0,0406*
56	0.469 *11,913*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	3.775 *95,885*	0.039 *0,991*	0.039 *0,991*	0.58 *263*	0.0012 *0,0305*	0.0012 *0,0305*	0.0016 *0,0406*	0.0016 *0,0406*
60	0.469 *11,913*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	4.014 *101,956*	0.039 *0,991*	0.039 *0,991*	0.61 *277*	0.0012 *0,0305*	0.0012 *0,0305*	0.0016 *0,0406*	0.0016 *0,0406*
64	0.469 *11,913*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	4.253 *108,026*	0.039 *0,991*	0.039 *0,991*	0.64 *290*	0.0012 *0,0305*	0.0012 *0,0305*	0.0016 *0,0406*	0.0016 *0,0406*
68	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.593 *15,062*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	4.517 *114,732*	0.039 *0,991*	0.039 *0,991*	0.73 *331*	0.0012 *0,0305*	0.0012 *0,0305*	0.0016 *0,0406*	0.0016 *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[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M[1]	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	**Version**	**Radial clearance**	
			KP..	**MKP..**
SK2	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R[1]	G395	Sealed	Reduced	–
SK2.R[1]	G354	Sealed	Reduced	–
P[1]	G354	Shielded	Standard	Reduced
PG81[1]	G395	Shielded	Standard	Reduced
PG81.R[1]	G395	Shielded	Reduced	–
P.R[1]	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[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** Sia max Standard	Precision	Sea max Standard	Precision	**Static limit loads** Radial C_s	Axial C_a	**Radial dynamic load rating**[3][4] Load fixed with respect to outer ring	inner ring	**Radial clearance** Standard	Reduced	**Maximum starting torque**[5] Shielded	Sealed
–	in/*mm*				lbf/*kN*				in/*mm*		oz-in/*mNm*	
47	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0010 *0,0254*	24 700 *109,86*	10 900 *48,49*	6 600 *29,36*	6 390 *28,42*	0.0003/ 0.0010 *0,0076/ 0,0254*	0.0001/ 0.0005 *0,0025/ 0,0127*	16 *112,96*	30 *211,85*
49	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0010 *0,0254*	27 500 *122,40*	12 100 *53,82*	8 150 *36,25*	7 840 *34,87*	0.0003/ 0.0010 *0,0076/ 0,0254*	0.0001/ 0.0005 *0,0025/ 0,0127*	16.67 *117,67*	32 *225,97*
52	0.0010 *0,0254*	0.0010 *0,0254*	0.0016 *0,0406*	0.0016 *0,0406*	28 700 *127,66*	12 600 *56,04*	8 210 *36,52*	7 880 *35,05*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		
56	0.0010 *0,0254*	0.0010 *0,0254*	0.0016 *0,0406*	0.0016 *0,0406*	31 200 *138,78*	13 700 *60,94*	8 240 *36,65*	7 970 *35,45*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*	Value shall be specified in purchase orders	
60	0.0010 *0,0254*	0.0010 *0,0254*	0.0016 *0,0406*	0.0016 *0,0406*	33 100 *147,23*	14 600 *64,94*	8 290 *36,88*	8 010 *35,63*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		
64	0.0010 *0,0254*	0.0010 *0,0254*	0.0016 *0,0406*	0.0016 *0,0406*	35 000 *155,68*	15 400 *68,5*	8 350 *37,14*	8 100 *36,03*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		
68	0.0010 *0,0254*	0.0010 *0,0254*	0.0016 *0,0406*	0.0016 *0,0406*	41 900 *186,37*	18 400 *81,84*	10 280 *45,73*	9 900 *44,04*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		

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[3] For average life of 10 000 complete 90° cycles

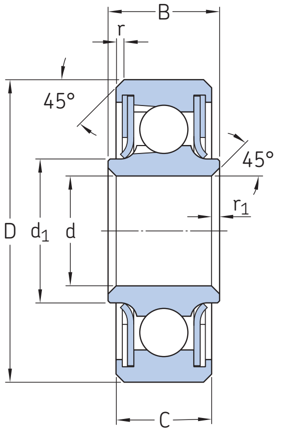
[4] If G395 load rating is 20% lower

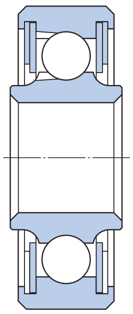
[5] Values are valid for bearings with G395. When using G354, values are 20% higher

1.16 Deep groove ball bearing single row, AS 27642 (Inch dimensions)

KP.. B bore code **72** to **96**

Technical specification	AS 7949
Product standard	AS 27642





Dimensions

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

Dimensions cont. and tolerances

Nominal bore code	Dimensions C	 ΔCs Standard	 Precision	 B	 ΔBs Standard	 Precision	 d_1 ≈	 r_1 +0.015/0 *+0,381/0*	 r +0.015/0 *+0,381/0*	Mass ≈	Tolerances Kia max Standard	 Precision	 Kea max Standard	 Precision
–	in/*mm*									lb/*g*	in/*mm*			
72	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.593 *15,062*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	4.774 *121,260*	0.039 *0,991*	0.039 *0,991*	0.76 *345*	0.0012 *0,0305*	0.0012 *0,0305*	0.0016 *0,0406*	0.0016 *0,0406*
76	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/ –0,127*	0.593 *15,062*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	5.046 *128,168*	0.039 *0,991*	0.039 *0,991*	1,00 *454*	0.0014 *0,0356*	0.0014 *0,0356*	0.0018 *0,0457*	0.0018 *0,0457*
80	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.593 *15,062*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	5.246 *133,248*	0.039 *0,991*	0.039 *0,991*	1,04 *472*	0.0014 *0,0356*	0.0014 *0,0356*	0.0018 *0,0457*	0.0018 *0,0457*
84	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.593 *15,062*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	5.506 *139,852*	0.039 *0,991*	0.039 *0,991*	1,09 *494*	0.0014 *0,0356*	0.0014 *0,0356*	0.0018 *0,0457*	0.0018 *0,0457*
88	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.593 *15,062*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	5.770 *146.558*	0.039 *0,991*	0.039 *0,991*	1,14 *517*	0.0014 *0,0356*	0.0014 *0,0356*	0.0018 *0,0457*	0.0018 *0,0457*
92	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.593 *15,062*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	6.033 *153.238*	0.039 *0,991*	0.039 *0,991*	1,18 *535*	0.0014 *0,0356*	0.0014 *0,0356*	0.0018 *0,0457*	0.0018 *0,0457*
96	0.531 *13,487*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.593 *15,062*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	6.303 *160.096*	0.039 *0,991*	0.039 *0,991*	1,23 *558*	0.0014 *0,0356*	0.0014 *0,0356*	0,0020 *0.0508*	0.0020 *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[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M[1]	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version	Radial clearance KP..	 MKP..
SK2	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R[1]	G395	Sealed	Reduced	–
SK2.R[1]	G354	Sealed	Reduced	–
P[1]	G354	Shielded	Standard	Reduced
PG81[1]	G395	Shielded	Standard	Reduced
PG81.R[1]	G395	Shielded	Reduced	–
P.R[1]	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[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 Sia max Standard	Precision	Sea max Standard	Precision	Static limit loads Radial C_s	Axial C_a	Radial dynamic load rating[3][4] Load fixed with respect to outer ring	inner ring	Radial clearance Standard	Reduced	Maximum starting torque[5] Shielded	Sealed
–	in/*mm*				lbf/*kN*				in/*mm*		oz-in/*mNm*	
72	0.0010 *0,0254*	0.0010 *0,0254*	0.0016 *0,0406*	0.0016 *0,0406*	44 300 *197,05*	19 500 *86,74*	10 333 *45,96*	10 000 *44,48*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*	Value shall be specified in purchase orders	
76	0.0012 *0,0305*	0.0012 *0,0305*	0.0018 *0,0457*	0.0018 *0,0457*	46 700 *207,72*	20 500 *91,18*	10 350 *46,04*	10 050 *44,70*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		
80	0.0012 *0,0305*	0.0012 *0,0305*	0.0018 *0,0457*	0.0018 *0,0457*	48 200 *214,39*	21 200 *94,30*	10 360 *46,08*	10 090 *44,88*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		
84	0.0012 *0,0305*	0.0012 *0,0305*	0.0018 *0,0457*	0.0018 *0,0457*	50 600 *225,07*	22 300 *99,19*	10 420 *46,35*	10 120 *45,02*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		
88	0.0012 *0,0305*	0.0012 *0,0305*	0.0018 *0,0457*	0.0018 *0,0457*	53 000 *235,76*	23 300 *103,64*	10 480 *46,62*	10 200 *45,37*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		
92	0.0012 *0,0305*	0.0012 *0,0305*	0.0018 *0,0457*	0.0018 *0,0457*	55 400 *246,43*	24 400 *108,54*	10 550 *46,93*	10 240 *45,55*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		
96	0.0016 *0,0406*	0.0016 *0,0406*	0.0020 *0,0508*	0.0020 *0,0508*	57 700 *256,66*	25 400 *112,98*	10 520 *46,80*	10 210 *45,42*	0.0003/ 0.0015 *0,0076/ 0,0381*	0.0001/ 0.0005 *0,0025/ 0,0127*		

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[3] For average life of 10 000 complete 90° cycles

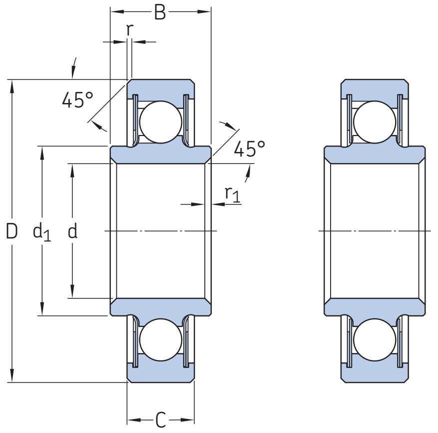
[4] If G395 load rating is 20% lower

[5] 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	AS 7949
Product standard	–



Dimensions, loads and clearance

Nominal bore code	**Dimensions** d +0.0002/–0.0003 *+0,0051/–0,0076*	D +0.0003/–0.0008 *+0,0076/–0,0203*	C 0/–0.005 *0/–0,127*	B 0/–0.005 *0/–0,127*	d_1 ≈	r_1	r	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a	**Radial clearance**
–	in/*mm*					Min		lb/g	lbf/*kN*		in/*mm*
3LSP1	0.1898 *4,821*	0.6250 *15,875*	0.2031 *5,159*	0.2500 *6,350*	0.282 *7,163*	0.016 *0,406*	0.016 *0,406*	0.011 *5*	1 560 *6,94*	700 *3,10*	0.0001/ 0.0005 *0,00254/ 0,0127*
4ASP3	0.2500 *6,350*	0.7500 *19,050*	0.2188 *5,558*	0.3125 *7,938*	0.356 *9,042*	0.025 *0,635*	0.016 *0,406*	0.022 *10*	1 870 *8,33*	840 *3,72*	0.0001/ 0.0005 *0,00254/ 0,0127*
4ASP4	0.2500 *6,350*	0.7500 *19,050*	0.2188 *5,558*	0.4375 *11,113*	0.356 *9,042*	0.025 *0,635*	0.016 *0,406*	0.024 *11*	1 870 *8,33*	840 *3,72*	0.0001/ 0.0005 *0,00254/ 0,0127*
4ASP5	0.2498 *6,345*	0.7503 *19,058*	0.2190 *5,563*	0.2810 *7,137*	0.346 *8,788*	0.015 *0,381*	0.015 *0,381*	0.018 *8*	1 870 *8,33*	840 *3,72*	0.0001/ 0.0005 *0,00254/ 0,0127*
4SP4	0.2498 *6,345*	0.9017 *22,903*	0.3350 *8,509*	0.4840 *12,294*	0.431 *10,947*	0.040 *1,016*	0.030 *0,762*	0.042 *19*	2 930 *13,02*	1 310 *5,81*	0.0001/ 0.0005 *0,00254/ 0,0127*
6ASP7	0.3750 *9,525*	0.8750 *22,225*	0.2188 *5,558*	0.3125 *7,938*	0.481 *12,217*	0.030 *0,762*	0.016 *0,406*	0.026 *12*	2 500 *11,11*	1 120 *4,96*	0.0001/ 0.0005 *0,00254/ 0,0127*
6ASP8	0.3750 *9,525*	0.8750 *22,225*	0.2188 *5,558*	0.4375 *11,113*	0.481 *12,217*	0.025 *0,635*	0.016 *0,406*	0.029 *13*	2 500 *11,11*	1 120 *4,96*	0.0001/ 0.0005 *0,00254/ 0,0127*
6ASP11	0.3750 *9,525*	0.8750 *22,225*	0.2188 *5,558*	0.5000 *12,700*	0.481 *12,217*	0.025 *0,635*	0.016 *0,406*	0.031 *14*	2 500 *11,11*	1 120 *4,96*	0.0001/ 0.0005 *0,00254/ 0,0127*
8ASP2	0.5000 *12,700*	1.1250 *28,575*	0.2500 *6,350*	0.3750 *9,525*	0.640 *16,256*	0.035 *0,889*	0.015 *0,381*	0.053 *24*	3 900 *17,36*	1 740 *7,75*	0.0001/ 0.0007 *0,0025/ 0,0178*
8SP2	0.4998 *12,695*	1.6878 *42,870*	0.5000 *12,700*	0.6200 *15,748*	0.750 *19,050*	0.035 *0,889*	0.035 *0,889*	0.218 *99*	11 800 *52,51*	5 270 *23,44*	0.0001/ 0.0007 *0,0025/ 0,0178*
10ASP6	0.6250 *15,875*	1.3750 *34,925*	0.2813 *7,145*	0.4063 *10,320*	0.810 *20,574*	0.033 *0,838*	0.031 *0,787*	0.088 *40*	5 970 *26,56*	2 670 *11,86*	0.0001/ 0.0007 *0,0025/ 0,0178*

Designation system

Examples: ZWKP8APSP2G81CP55RP01
KP4SP4

ZW KP 8 A P SP2 G81 CP55 RP01

Material and surface treatment

No code	Cadmium plated bearing 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 1/16th inch)

Shield and seal

No code	Sealed
P	Shielded

Lubricant

No code	Grease G354
G81	Grease G395

Passivation

No code	Not treated
CP55[1]	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

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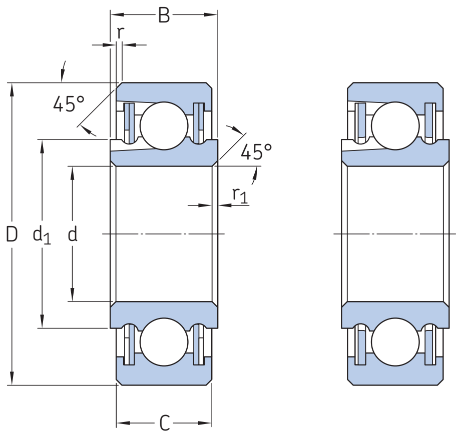
[1] Available only for corrosion-resistant steel material without other surface treatment

1.18 Deep groove ball bearing single row, AS 27646, AS 21428 (Inch dimensions)

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



Technical specification AS 7949

Product standard
Standard tolerances: AS 27646
Precision tolerances: AS 21428

Dimensions

Nominal bore code	Dimensions d	Δdmp Standard	Precision	Δds Standard	D	ΔDmp Standard	Precision	ΔDs
–	in/*mm*							
538	0.6250 *15,875*	+0.0007/–0.0007 *+0,0178/–0,0178*	0/–0.0005 *0/–0,0127*	+0.0010/–0.0010 *+0,0254/–0,0254*	1.0625 *26,987*	0/–0.0010 *0/–0,0254*	0/–0.0005 *0/–0,0127*	+0.0005/–0.0015 *+0,0127/–0,0381*
539	0.7500 *19,050*	+0.0007/–0.0007 *+0,0178/–0,0178*	0/–0.0005 *0/–0,0127*	+0.0010/–0.0010 *+0,0254/–0,0254*	1.1875 *30,162*	0/–0.0010 *0/–0,0254*	0/–0.0005 *0/–0,0127*	+0.0005/–0.0015 *+0,0127/–0,0381*
540	0.8750 *22,225*	+0.0007/–0.0007 *+0,0178/–0,0178*	0/–0.0005 *0/–0,0127*	+0.0010/–0.0010 *+0,0254/–0,0254*	1.3125 *33,338*	0/–0.0010 *0/–0,0254*	0/–0.0005 *0/–0,0127*	+0.0005/–0.0015 *+0,0127/–0,0381*
541	1.0625 *26,987*	+0.0007/–0.0007 *+0,0178/–0,0178*	0/–0.0005 *0/–0,0127*	+0.0010/–0.0010 *+0,0254/–0,0254*	1.5000 *38,100*	0/–0.0010 *0/–0,0254*	0/–0.0005 *0/–0,0127*	+0.0005/–0.0015 *+0,0127/–0,0381*
542	1.3125 *33,337*	+0.0007/–0.0007 *+0,0178/–0,0178*	0/–0.0005 *0/–0,0127*	+0.0010/–0.0010 *+0,0254/–0,0254*	1.7500 *44,450*	0/–0.0010 *0/–0,0254*	0/–0.0005 *0/–0,0127*	+0.0005/–0.0015 *+0,0127/–0,0381*

Dimensions cont. and tolerances

Nominal bore code	Dimensions C	ΔCs Standard	Precision	B	ΔBs Standard	Precision	d_1 ≈	r_1 *+0.015/0* *+0,381/0*	r *+0.015/0* *+0,381/0*	Mass ≈	Tolerances Kia max Standard	Precision	Kea max Standard	Precision
–	in/*mm*									lb/*g*	in/*mm*			
538	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/ –0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.740 *18,796*	0.015 *0,381*	0.015 *0,381*	0.03 *14*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
539	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.858 *21,793*	0.015 *0,381*	0.015 *0,381*	0.04 *18*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
540	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.976 *24,779*	0.015 *0,381*	0.015 *0,381*	0.05 *23*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
541	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.173 *29,794*	0.015 *0,381*	0.015 *0,381*	0.06 *27*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
542	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.417 *35,992*	0.015 *0,381*	0.015 *0,381*	0.09 *41*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *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[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M	Reduced clearance and precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version
DDSK2	G354	Sealed
DDS281	G395	Sealed
PG81[1]	G395	Shielded
P[1]	G354	Shielded

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[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 Sia max Standard	Precision	Sea max Standard	Precision	Static limit loads Radial C_s	Axial C_a	Radial dynamic load rating[3][4] Load fixed with respect to outer ring	inner ring	Radial clearance Standard	Reduced	Maximum starting torque[5] Shielded	Sealed
–	in/*mm*				lbf/*kN*				in/*mm*		oz-in/*mNm*	
538	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	3 280 *14,6*	1 500 *6,67*	1 990 *8,85*	1 820 *8,10*	0.0008/ 0.0018 *0,0203/ 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	1.33 9,41	2 14,12
539	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	3 750 *16,69*	1 700 *7,56*	2 050 *9,12*	1 900 *8,45*	0.0008/ 0.0018 *0,0203 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	1.33 9,41	2 14,12
540	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	4 220 *18,78*	1 900 *8,45*	2 110 *9,39*	1 970 *8,76*	0.0008/ 0.0018 *0,0203/ 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	2 14,12	3 21,18
541	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	5 000 *22,25*	2 200 *9,79*	2 170 *9,65*	2 020 *8,99*	0.0008/ 0.0018 *0,0203 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	2.67 18,83	4 28,25
542	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	5 950 *26,48*	2 700 *12,01*	2 220 *9,88*	2 130 *9,47*	0.0008/ 0.0018 *0,0203/ 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	2.67 18,83	4 28,25

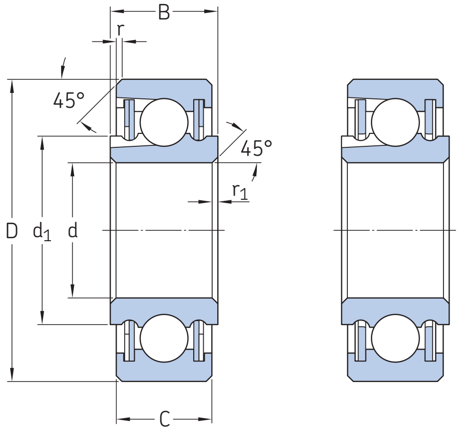
[3] For average life of 10 000 complete 90° cycles

[4] If G395 load rating is 20% lower

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

1.18 Deep groove ball bearing single row, AS 27646, AS 21428 (Inch dimensions)

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



Technical specification	AS 7949
Product standard	
Standard tolerances:	AS 27646
Precision tolerances:	AS 21428

Dimensions

Nominal bore code	Dimensions d	Δdmp Standard	Precision	Δds Standard	D	ΔDmp Standard	Precision	ΔDs
–	in/*mm*							
543	1.5625 *39,687*	+0.0007/–0.0007 *+0,0178/–0,0178*	0/–0.0005 *0/–0,0127*	+0.0010/–0.0010 *+0,0254/–0,0254*	2.0000 *50,800*	0/–0.0010 *0/–0,0254*	0/–0.0005 *0/–0,0127*	+0.0005/–0.0015 *+0,0127/–0,0381*
544	1.8125 *46,037*	+0.0010/–0.0010 *+0,0254/–0,0254*	0/–0.0008 *0/–0,0203*	+0.0016/–0.0016 *+0,0406/–0,0406*	2.2500 *57,150*	0/–0.0015 *0/–0,0381*	0/–0.0007 *0/–0,0178*	+0.0008/–0.0023 *+0,0203/–0,0584*
545	2.0625 *52,387*	+0.0010/–0.0010 *+0,0254/–0,0254*	0/–0.0008 *0/–0,0203*	+0.0016/–0.0016 *+0,0406/–0,0406*	2.6250 *66,675*	0/–0.0015 *0/–0,0381*	0/–0.0007 *0/–0,0178*	+0.0008/–0.0023 *+0,0203/–0,0584*
546	2.3125 *58,737*	+0.0010/–0.0010 *+0,0254/–0,0254*	0/–0.0008 *0/–0,0203*	+0.0016/–0.0016 *+0,0406/–0,0406*	2.8750 *73,025*	0/–0.0015 *0/–0,0381*	0/–0.0007 *0/–0,0178*	+0.0008/–0.0023 *+0,0203/–0,0584*

Dimensions cont. and tolerances

Nominal bore code	Dimensions C	ΔCs Standard	Precision	B	ΔBs Standard	Precision	d_1 ≈	r_1 *+0.015/0* *+0,381/0*	r *+0.015/0* *+0,381/0*	Mass ≈	Tolerances Kia max Standard	Precision	Kea max Standard	Precision
–	in/*mm*									lb/*g*	in/*mm*			
543	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/ –0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.673 *42,494*	0.015 *0,381*	0.015 *0,381*	0.10 *45*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
544	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.949 *49,505*	0.015 *0,381*	0.015 *0,381*	0.11 *50*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
545	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	2.264 *57,506*	0.015 *0,381*	0.015 *0,381*	0.15 *68*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
546	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	2.508 *63,703*	0.015 *0,381*	0.015 *0,381*	0.17 *77*	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *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[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M	Reduced clearance and precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	**Version**
DDSK2	G354	Sealed
DDS281	G395	Sealed
PG81[1]	G395	Shielded
P[1]	G354	Shielded

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[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** Sia max Standard	Sia max Precision	Sea max Standard	Sea max Precision	**Static limit loads** Radial C_s	Axial C_a	**Radial dynamic load rating**[3][4] Load fixed with respect to outer ring	inner ring	**Radial clearance** Standard	Reduced	**Maximum starting torque**[5] Shielded	Sealed
–	in/*mm*				lbf/*kN*				in/*mm*		oz-in/*mNm*	
543	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	6 880 *30,62*	3 200 *14,24*	2 260 *10,05*	2 180 *9,70*	0.0008/ 0.0018 *0,0203/ 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	3.33 23,53	5 35,31
544	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	7 980 *35,51*	3 600 *16,02*	2 300 *10,23*	2 220 *9,88*	0.0008/ 0.0018 *0,0203 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	3.33 23,53	6 42,36
545	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	9 220 *41,03*	4 000 *17,80*	2 340 *10,41*	2 260 *10,05*	0.0008/ 0.0018 *0,0203/ 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	4 28,25	7 49,42
546	0.0020 *0,0508*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*	10 150 *45,17*	4 400 *19,58*	2 360 *10,50*	2 280 *10,14*	0.0008/ 0.0018 *0,0203 0,0457*	0.0001/ 0.0005 *0,0025/ 0,0127*	4 28,25	8 56,48

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[3] For average life of 10 000 complete 90° cycles

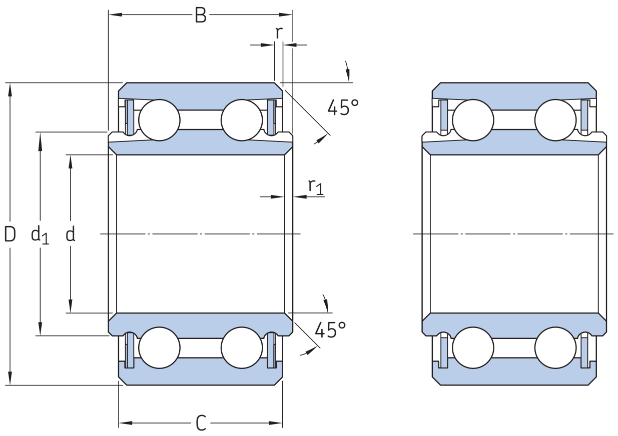
[4] If G395 load rating is 20% lower

[5] 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	AS 7949
Product standard	–



Dimensions

Nominal bore code	**Dimensions** d	Δdmp	D	Δ Dmp	C	Δ Cs	B	Δ Bs	d_1 ≈	r_1 +0.020/0 *+0,508/0*	r +0.020/0 *+0,508/0*
–	in/*mm*										
5538	0.6250 *15,875*	0/–0.0005 *0/–0,0013*	1.0625 26,987	0/–0.0005 *0/–0,0013*	0.500 12,700	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	0.740 *18,796*	0.015 *0,381*	0.015 *0,381*
5539	0.7500 *19,050*	0/–0.0005 *0/–0,0013*	1.1875 *30,162*	0/–0.0005 *0/–0,0013*	0.500 *12,700*	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	0.858 *21,793*	0.015 *0,381*	0.015 *0,381*
5540	0.8750 *22,225*	0/–0.0005 *0/–0,0013*	1.3125 *33,338*	0/–0.0005 *0/–0,0013*	0.500 *12,700*	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	0.976 *24,779*	0.015 *0,381*	0.015 *0,381*
5541	1.0625 *26,987*	0/–0.0005 *0/–0,0013*	1.5000 *38,100*	0/–0.0005 *0/–0,0013*	0.500 *12,700*	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	1.173 *29,794*	0.015 *0,381*	0.015 *0,381*
5542	1.3125 *33,337*	0/–0.0005 *0/–0,0013*	1.7500 *44,450*	0/–0.0005 *0/–0,0013*	0.500 *12,700*	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	1.417 *35,992*	0.015 *0,381*	0.015 *0,381*
5543	1.5625 *39,687*	0/–0.0005 *0/–0,0013*	2.0000 *50,800*	0/–0.0005 *0/–0,0013*	0.500 *12,700*	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	1.673 *42,494*	0.015 *0,381*	0.015 *0,381*
5544	1.8125 *46,037*	0/–0.0008 *0/–0,0020*	2.2500 57,150	0/–0.0007 *0/–0,0018*	0.500 12,700	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	1.949 *49,505*	0.015 *0,381*	0.015 *0,381*
5545	2.0625 *52,387*	0/–0.0008 *0/–0,0020*	2.6250 *66,675*	0/–0.0007 *0/–0,0018*	0.500 *12,700*	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	2.264 *57,506*	0.015 *0,381*	0.015 *0,381*
5546	2.3125 *58,737*	0/–0.0008 *0/–0,0020*	2.8750 *73,025*	0/–0.0007 *0/–0,0018*	0.500 *12,700*	0/–0.0005 *0/–0,0127*	0.562 *14,270*	0/–0.0005 *0/–0,0127*	2.508 *63,703*	0.015 *0,381*	0.015 *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 1/16th inch)

Variation

	Lubricant	**Version**
DDSK2	G354	Sealed
DDS281	G395	Sealed
PG81	G395	Shielded
P	G354	Shielded

Passivation

No code	Not treated
CP55[1]	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

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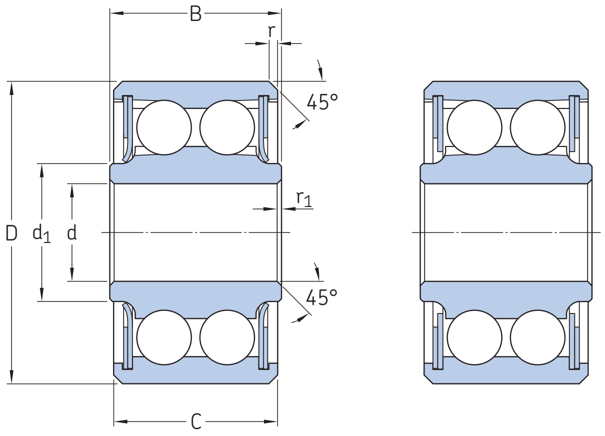
[1] SKF option, available only for corrosion-resistant steel material without other surface treatment

Tolerances, loads and clearance

Nominal bore code	Mass ≈	Tolerances Kia max	Kea max	Sia max	Sea max	Static limit loads Radial C_s	Axial C_a	Radial clearance
–	lb/g	in/*mm*				lbf/*kN*		in/*mm*
5538	0.04 *18*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	6 250 *28,00*	2 060 *9,15*	0.0008/ 0.0018 *0,0203/ 0,0457*
5539	0.06 *27*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	7 190 *32,00*	2 370 *10,60*	0.0008/ 0.0018 *0,0203/ 0,0457*
5540	0.08 *36*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	8 120 *36,00*	2 680 *12,00*	0.0008/ 0.0018 *0,0203/ 0,0457*
5541	0.10 *45*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	9 690 *43,00*	3 200 *14,30*	0.0008/ 0.0018 *0,0203/ 0,0457*
5542	0.14 *64*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	11 600 *52,00*	3 820 *17,00*	0.0008/ 0.0018 *0,0203/ 0,0457*
5543	0.16 *73*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	13 400 *60,00*	4 430 *19,60*	0.0008/ 0.0018 *0,0203/ 0,0457*
5544	0.18 *82*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	15 600 *69 500,00*	5 160 *22,80*	0.0008/ 0.0018 *0,0203/ 0,0457*
5545	0.26 *118*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	18 100 *80,00*	5 980 *26,50*	0.0008/ 0.0018 *0,0203/ 0,0457*
5546	0.30 *136*	0.0020 *0,0508*	0.0016 *0,0406*	0.0020 *0,0508*	0.0016 *0,0406*	20 000 *90,00*	6 600 *29,00*	0.0008/ 0.0018 *0,0203/ 0,0457*

1.20 Deep groove ball bearing double row, AS 27644 (Inch dimensions)

DPP..



Technical specification	AS 7949
Product standard	AS 27644

Dimensions

Nominal bore code	**Dimensions** d	Δdmp Standard	SKF super precision	Δds	D	ΔDmp Standard	SKF super precision	ΔDs	C	ΔCs Standard	SKF super precision
–	in/*mm*										
3	0.1900 *4,826*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.7774 *19,745*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.473 *12,014*	0/–0.005 *0/ –0,127*	0/–0.005 *0/ –0,127*
4	0.2500 *6,350*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.9014 *22,895*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.491 *12,471*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
5	0.3125 *7,937*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.2500 *31,750*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.687 *17,449*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
6	0.3750 *9,525*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.4375 *36,512*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.794 *20,167*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
8	0.5000 12,700	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.6875 42,862	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.856 21,742	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
10	0.6250 *15,875*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.9375 *49,212*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.920 *23,368*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	**Dimensions** B	ΔBs Standard	SKF super precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	**Mass** ≈	**Tolerances** Kia max Standard	SKF super precision	Kea max Standard	SKF super precision	Sia max Standard	SKF super precision
–	in/*mm*						lb/*g*	in/*mm*					
3	0.495 *12,573*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.302 *7,670*	0.005 *0,127*	0.018 *0,450*	0.04 *18*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
4	0.620 *15,748*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.410 *10,414*	0.005 *0,127*	0.032 *0,813*	0.06 *27*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
5	0.745 *18,923*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.469 *11,912*	0.015 *0,381*	0.032 *0,813*	0.17 *77*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
6	0.870 *22,098*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.551 *13,995*	0.015 *0,381*	0.032 *0,813*	0.26 *118*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
8	*0.932* *23,672*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	*0.735* *18,669*	*0.015* *0,381*	*0.044* *1,118*	*0.38* *172*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*
10	*0.995* *25,273*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	*0.890* *22,606*	*0.015* *0,381*	*0.044* *1,118*	*0.53* *240*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*	0.0010 *0,0254*	0.0007 *0,0178*

Designation system

Examples:	ZWMDPP10SK2CP55RP01 DPP3P	ZW	M	DDP	10	SK2	CP55	RP01

Material and surface treatment

No code	Cadmium plated bearing steel
W1)	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW1)	Cadmium plated corrosion-resistant steel
SZW1)	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M1)	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version	Radial clearance	
			DPP..	MDPP..1)
SK2	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R1)	G395	Sealed	Reduced	–
SK2.R1)	G354	Sealed	Reduced	–
P1)	G354	Shielded	Standard	Reduced
PG811)	G395	Shielded	Standard	Reduced
PG81.R1)	G395	Shielded	Reduced	–
P.R1)	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP552)	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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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 Sea max		Static limit loads		Radial dynamic load rating3)4)		Radial clearance		Maximum starting torque5)	
	Standard	SKF super precision	Radial C_s	Axial C_a	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 *0,0406*	0.0010 *0,0254*	2 950 *13,12*	1 700 *7,56*	2 950 *13,12*	2 830 *12,59*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.67 *4,71*	1 *7,06*
4	0.0016 *0,0406*	0.0010 *0,0254*	5 370 *23,89*	1 800 *8,01*	3 550 *15,79*	3 020 *13,43*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.67 *4,71*	1 *7,06*
5	0.0016 *0,0406*	0.0010 *0,0254*	11 000 *48,94*	4 000 *17,80*	7 360 *32,74*	6 250 *27,80*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.67 *4,71*	1.5 *10,59*
6	0.0016 *0,0406*	0.0010 *0,0254*	15 760 *70,13*	5 300 *23,57*	9 690 *43,10*	8 120 *36,12*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	1.33 *9,41*	2 *14,12*
8	0.0016 *0,0406*	0.0010 *0,0254*	*23 600* *105,01*	*7 800* *34,71*	*14 100* *62,72*	*11 600* *51,60*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	1.33 *9,41*	*3* *21,18*
10	0.0016 *0,0406*	0.0010 *0,0254*	*28 400* *126,39*	*9 400* *41,83*	*15 300* *68,06*	*13 100* *58,27*	0.0004/ 0.0010 *0,0101/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	*2* *14,12*	*4.5* *31,78*

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3) For average life of 10 000 complete 90° cycles

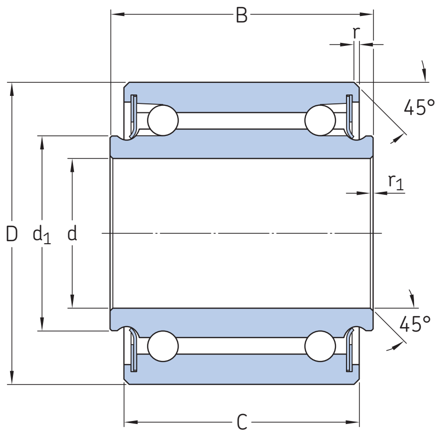
4) If G395 load rating is 20% lower

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

1.21 Deep groove ball bearing double row, AS 27647 (Inch dimensions)

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

Technical specification	AS 7949
Product standard	AS 27647



Dimensions

Nominal bore code	**Dimensions** d	Δdmp Standard	SKF super precision	Δds	D	ΔDmp Standard	SKF super precision	ΔDs	C	ΔCs Standard	SKF super precision
–	in/*mm*										
4K2	0.2500	0/–0.005	0/–0.003	+0.0002/–0.0007	0.6250	0/–0.005	0/–0.0004	+0.0005/–0.0010	0.500	0/–0.005	0/–0.005
	6,350	*0/–0,127*	*0/–0,076*	*+0,0050/–0,0178*	*15,875*	*0/–0,127*	*0/–0,0101*	*+0,0127/–0,0254*	*12,700*	*0/ –0,127*	*0/ –0,127*
4K	0.2500	0/–0.005	0/–0.003	+0.0002/–0.0007	0.7500	0/–0.005	0/–0.0004	+0.0005/–0.0010	0.750	0/–0.005	0/–0.005
	6,350	*0/–0,127*	*0/–0,076*	*+0,0050/–0,0178*	*19,050*	*0/–0,127*	*0/–0,0101*	*+0,0127/–0,0254*	*19,050*	*0/–0,127*	*0/–0,127*
4[1)]	0.2500	0/–0.005	0/–0.003	+0.0002/–0.0007	0.7500	0/–0.005	0/–0.0004	+0.0005/–0.0010	0.750	0/–0.005	0/–0.005
	6,350	*0/–0,127*	*0/–0,076*	*+0,0050/–0,0178*	*19,050*	*0/–0,127*	*0/–0,0101*	*+0,0127/–0,0254*	*19,050*	*0/–0,127*	*0/–0,127*
5	0.3125	0/–0.005	0/–0.003	+0.0002/–0.0007	0.8750	0/–0.005	0/–0.0004	+0.0005/–0.0010	0.813	0/–0.005	0/–0.005
	7,938	*0/–0,127*	*0/–0,076*	*+0,0050/–0,0178*	*22,225*	*0/–0,127*	*0/–0,0101*	*+0,0127/–0,0254*	*20,650*	*0/–0,127*	*0/–0,127*
6	0.3750	0/–0.005	0/–0.003	+0.0002/–0.0007	1.0625	0/–0.005	0/–0.0004	+0.0005/–0.0010	1.063	0/–0.005	0/–0.005
	9,525	*0/–0,127*	*0/–0,076*	*+0,0050/–0,0178*	*26,988*	*0/–0,127*	*0/–0,0101*	*+0,0127/–0,0254*	27,000	*0/–0,127*	*0/–0,127*
8	0.5000	0/–0.005	0/–0.003	+0.0002/–0.0007	1.4375	0/–0.005	0/–0.0004	+0.0005/–0.0010	1.375	0/–0.005	0/–0.005
	12,700	*0/–0,127*	*0/–0,076*	*+0,0050/–0,0178*	*36,512*	*0/–0,127*	*0/–0,0101*	*+0,0127/–0,0254*	*34,925*	*0/–0,127*	*0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	**Dimensions** B	ΔBs Standard	SKF super precision	d$_1$ ≈	r$_1$ +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	**Mass** ≈	**Tolerances** Kia max Standard	SKF super precision	Kea max Standard	SKF super precision	Sia max Standard	SKF super precision
–	in/*mm*						lb/*g*	in/*mm*					
4K2	0.562	0/–0.005	0/–0.0025	0.344	0.005	0.016	0.025	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	14,275	*0/–0,127*	*0/–0,0635*	*8,738*	*0,127*	*0,406*	*11*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
4K	0.875	0/–0.005	0/–0.0025	0.385	0.005	0.016	0.04	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	22,225	*0/–0,127*	*0/–0,0635*	*9,779*	*0,127*	*0,406*	*18*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
4[1)]	0.875	0/–0.005	0/–0.0025	0.375	0.005	0.016	0.06	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	22,225	*0/–0,127*	*0/–0,0635*	*9,525*	*0,127*	*0,406*	*27*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
5	0.938	0/–0.005	0/–0.0025	0.472	0.005	0.016	0.07	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	23,825	*0/–0,127*	*0/–0,0635*	*11,989*	*0,127*	*0,406*	*32*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
6	*1.188*	0/–0.005	0/–0.0025	*0.576*	*0.005*	*0.016*	*0.12*	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	30,175	*0/–0,127*	*0/–0,0635*	*14,630*	*0,127*	*0,406*	*54*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*
8	*1.500*	0/–0.005	0/–0.0025	*0.715*	*0.005*	*0.032*	*0.29*	0.0010	0.0005	0.0016	0.0008	0.0010	0.0007
	38,100	*0/–0,127*	*0/–0,0635*	*18,161*	*0,127*	*0,813*	*132*	*0,0254*	*0,0127*	*0,0406*	*0,0203*	*0,0254*	*0,0178*

Designation system

Examples: ZWMDW6SK2CP55RP01
DW4K2S281.R

ZW M DW 6 SK2 CP55 RP01

Material and surface treatment

No code	Cadmium plated bearing steel
W[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M[1]	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version	Radial clearance	
			DW..	**MDW..**[1]
SK2	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R	G395	Sealed	Reduced	–
SK2.R	G354	Sealed	Reduced	–

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[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 Sea max Standard	SKF super precision	Static limit loads Radial C_s	Axial C_a	Radial dynamic load rating[3][4] Load fixed with respect to outer ring	inner ring	Radial clearance Standard	Reduced	Maximum starting torque[5]
–	in/*mm*		lbf/*kN*				in/*mm*		oz-in/*mNm*
4K2	0.0016	0.0010	1 400	500	1 050	960	0/ 0.0010	0.0002/ 0.0005	1
	0,0406	*0,0254*	*6,20*	*2,24*	*4,67*	*4,27*	*0/ 0,0254*	*0,0051/ 0,0127*	*7,06*
4K	0.0016	0.0010	2 770	900	2 070	1 850	0/ 0.0010	0.0002/ 0.0005	1
	0,0406	*0,0254*	*12,20*	*4,00*	*9,21*	*8,23*	*0/ 0,0254*	*0,0051/ 0,0127*	*7,06*
4[1]	0.0016	0.0010	3 750	1 240	2 070	1 850	0/ 0.0010	0.0002/ 0.0005	1
	0,0406	*0,0254*	*16,60*	*5,50*	*9,21*	*8,23*	*0/ 0,0254*	*0,0051/ 0,0127*	*7,06*
5	0.0016	0.0010	5 140	1 600	2 600	2 320	0/ 0.0010	0.0002/ 0.0005	1.5
	0,0406	*0,0254*	*22,80*	*7,10*	*11,57*	*10,32*	*0/ 0,0254*	*0,0051/ 0,0127*	*10,59*
6	0.0016	0.0010	*8 440*	*2 600*	*4 220*	*3 740*	0/ 0.0010	0.0002/ 0.0005	2.5
	0,0406	*0,0254*	*37,50*	*11,60*	*18,77*	*16,64*	*0/ 0,0254*	*0,0051/ 0,0127*	*17,65*
8	0.0016	0.0010	*15 520*	*4 700*	*7 610*	*6 520*	0/ 0.0010	0.0002/ 0.0005	2.5
	0,0406	*0,0254*	*69,50*	*20,80*	*33,85*	*29,00*	*0/ 0,0254*	*0,0051/ 0,0127*	*17,65*

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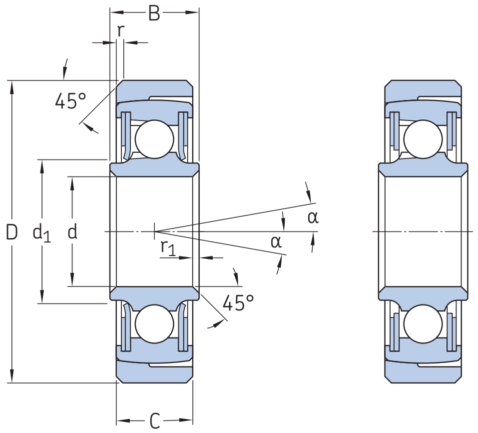
[3] For average life of 10 000 complete 90° cycles
[4] If G395 load rating is 20% lower
[5] Values are valid for bearings with G395. When using G354, values are 20% higher

1.22 Deep groove ball bearing with self-aligning ring single row, AS 27648 (Inch dimensions)

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

Technical specification	AS 7949
Product standard	AS 27648



Dimensions

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

Dimensions cont. and tolerances

Nominal bore code	Dimensions B	Δ_{Bs} Standard	SKF super precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	α	Mass ≈	Tolerances Kia max Standard	SKF super precision	Kea max Standard	SKF super precision
–	in/*mm*						°	lb/*g*	in/*mm*			
16	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.141 *28,981*	0.0240 *0,610*	0.0240 *0,610*	7°25'	0.18 *82*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
21	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.454 *36,931*	0.0240 *0,610*	0.0240 *0,610*	6°30'	0.20 *90*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
23	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.574 *39,979*	0.0240 *0,610*	0.0240 *0,610*	6°	0.22 *99*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
25	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.693 *43,002*	0.0240 *0,838*	0.0240 *0,838*	5°45'	0.25 *113*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *0,0203*
29	0.437 *11,099*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	1.931 *49,047*	0.0240 *0,610*	0.0240 *0,610*	5°	0.27 *122*	0.0010 *0,0254*	0.0008 *0,0203*	0.0016 *0,0406*	0.0008 *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
W1)	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW1)	Cadmium plated corrosion-resistant steel
SZW1)	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M1)	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	**Version**
SK2	G354	Sealed
S281	G395	Sealed
PG811)	G395	Shielded
P1)	G354	Shielded

Passivation

No code	Not treated
CP552)	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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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** Sia max Standard	SKF super precision	Sea max Standard	SKF super precision	**Static limit loads** Radial C_s	Axial C_a	**Radial dynamic load rating**3)4) Load fixed with respect to outer ring	inner ring	**Radial clearance** Standard	Reduced	**Maximum starting torque**5) Shielded	Sealed
–	in/*mm*				lbf/*kN*				in/*mm*		oz-in/*mNm*	
16	0.0010	0.0008	0.0016	0.0010	8 085	1 600	4 260	3 960	0.0003/ 0.0010	0.0001/ 0.0005	3.33	5
	0,0254	*0,0203*	*0,0406*	*0,0254*	*35,98*	*7,12*	*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	2 000	4 590	4 290	0.0003/ 0.0010	0.0001/ 0.0005	4.67	7
	0,0254	*0,0203*	*0,0406*	*0,0254*	*43,78*	*8,90*	*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	2 200	4 650	4 360	0.0003/ 0.0010	0.0001/ 0.0005	5.33	9
	0,0254	*0,0203*	*0,0406*	*0,0254*	*46,72*	*9,79*	*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	2 300	4 680	4 420	0.0003/ 0.0010	0.0001/ 0.0005	6	9
	0,0254	*0,0203*	*0,0406*	*0,0254*	*50,27*	*10,23*	*20,82*	*19,66*	*0,0076/ 0,0254*	*0,0025/ 0,0127*	*42,37*	*63,54*
29	0.0010	0.0008	0.0016	0.0010	12 700	2 600	4 760	4 530	0.0003/ 0.0010	0.0001/ 0.0005	8	14
	0,0254	*0,0203*	*0,0406*	*0,0254*	*56,51*	*11,57*	*21,17*	*20,15*	*0,0076/ 0,0254*	*0,0025/ 0,0127*	*56,48*	*98,84*

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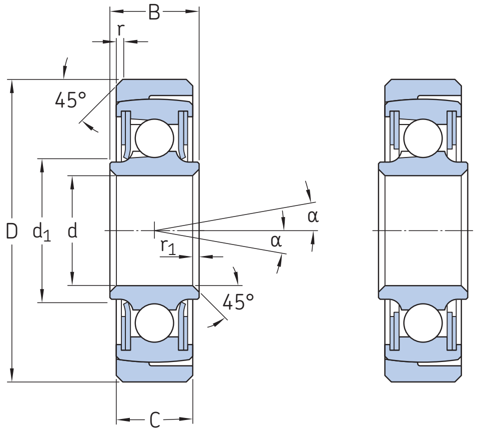
3) For average life of 10 000 complete 90° cycles
4) If G395 load rating is 20% lower
5) Values are valid for bearings with G395. When using G354, values are 20% higher

1.22 Deep groove ball bearing with self-aligning ring single row, AS 27648 (Inch dimensions)

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

Technical specification	AS 7949
Product standard	AS 27648



Dimensions

Nominal bore code	Dimensions										
	d	Δdmp Standard	SKF super precision	Δds	D	ΔDmp Standard	SKF super precision	ΔDs	C	ΔCs Standard	SKF super precision
–	in/*mm*										
33	2.0630	0/–0.0010	–0.0005/–0.0010	+0.0008/–0.0008	3.0000	0/–0.0010	0/–0.0010	+0.0010/–0.0020	0.375	0/–0.005	0/–0.005
	52,400	*0/–0,0254*	*–0,0127/–0,0254*	*+0,0127/–0,0381*	*76,200*	*0/–0,0254*	*0/–0,0254*	*+0,0254/–0,0508*	*9,525*	*0/ –0,127*	*0/ –0,127*
37	2.3130	0/–0.0010	–0.0005/–0.0010	+0.0008/–0.0008	3.2500	0/–0.0010	0/–0.0010	+0.0010/–0.0020	0.375	0/–0.005	0/–0.005
	58,750	*0/–0,0254*	*–0,0127/–0,0254*	*+0,0203/–0,0203*	*82,550*	*0/–0,0254*	*0/–0,0254*	*+0,0254/–0,0508*	*9,525*	*0/–0,127*	*0/–0,127*
47	2.9380	0/–0.0010	–0.0005/–0.0010	+0.0008/–0.0008	4.1250	0/–0.0010	0/–0.0010	+0.0010/–0.0020	0.469	0/–0.005	0/–0.005
	74,625	*0/–0,0254*	*–0,0127/–0,0254*	*+0,0203/–0,0203*	*104,775*	*0/–0,0254*	*0/–0,0254*	*+0,0254/–0,0508*	*11,912*	*0/–0,127*	*0/–0,127*
48	3.0005	0/–0.0010	–0.0005/–0.0010	+0.0008/–0.0008	4.2500	0/–0.0010	0/–0.0010	+0.0010/–0.0020	0.469	0/–0.005	0/–0.005
	76.213	*0/–0,0254*	*–0,0127/–0,0254*	*+0,0203/–0,0203*	*107,950*	*0/–0,0254*	*0/–0,0254*	*+0,0254/–0,0508*	*11,912*	*0/–0,127*	*0/–0,127*
49	3.0630	0/–0.0010	–0.0005/–0.0010	+0.0008/–0.0008	4.2500	0/–0.0010	0/–0.0010	+0.0010/–0.0020	0,469	0/–0.005	0/–0.005
	77,800	*0/–0,0254*	*–0,0127/–0,0254*	*+0,0203/–0,0203*	*107,950*	*0/–0,0254*	*0/–0,0254*	*+0,0254/–0,0508*	*11,912*	*0/–0,127*	*0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	Dimensions						α	Mass	Tolerances			
	B	ΔBs Standard	SKF super precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*		≈	Kia max Standard	SKF super precision	Kea max Standard	SKF super precision
–	in/*mm*						°	lb/*g*	in/*mm*			
33	0.437	0/–0.005	0/–0.0025	2.231	0.0240	0.0240	5°	0,30	0.0010	0.0008	0.0016	0.0008
	11,099	*0/–0,127*	*0/–0,0635*	*56,667*	*0,610*	*0,610*		*136*	*0,0254*	*0,0203*	*0,0406*	*0,0203*
37	0.437	0/–0.005	0/–0.0025	2.468	0.0240	0.0240	4°30'	0,33	0.0010	0.0008	0.0016	0.0008
	11,099	*0/–0,127*	*0/–0,0635*	*62,687*	*0,610*	*0,610*		*150*	*0,0254*	*0,0203*	*0,0406*	*0,0203*
47	0.531	0/–0.005	0/–0.0025	3.093	0.0390	0.0390	4°30'	0,64	0.0010	0.0008	0.0016	0.0008
	13,487	*0/–0,127*	*0/–0,0635*	*78,562*	*0,990*	*0,990*		*290*	*0,0254*	*0,0203*	*0,0406*	*0,0203*
48	0.531	0/–0.005	0/–0.0025	3.222	0.0390	0.0390	4°	0,69	0.0010	0.0008	0.0016	0.0008
	13,487	*0/–0,127*	*0/–0,0635*	*81,838*	*0,990*	*0,990*		*313*	*0,0254*	*0,0203*	*0,0406*	*0,0203*
49	0.531	0/–0.005	0/–0.0025	3.222	0.0390	0.0390	4°	0,69	0.0010	0.0008	0.0016	0.0008
	13,487	*0/–0,127*	*0/–0,0635*	*81,838*	*0,990*	*0,990*		*313*	*0,0254*	*0,0203*	*0,0406*	*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
W1)	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW1)	Cadmium plated corrosion-resistant steel
SZW1)	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M1)	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	**Version**
SK2	G354	Sealed
S281	G395	Sealed
PG811)	G395	Shielded
P1)	G354	Shielded

Passivation

No code	Not treated
CP552)	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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

Tolerances cont., loads, clearance and torque

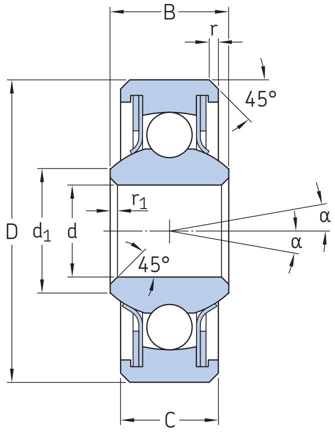
Nominal bore code	**Tolerances**				**Static limit loads**		**Radial dynamic load rating**3)4)		**Radial clearance**		**Maximum starting torque**5)	
	Sia max		Sea max		Radial	Axial	Load fixed with respect to		Standard	Reduced	Shielded	Sealed
	Standard	SKF super precision	Standard	SKF super precision	C_s	C_a	outer ring	inner ring				
–	in/*mm*				lbf/*kN*				in/*mm*		oz-in/*mNm*	
33	0.0010	0.0008	0.0016	0.0010	14 400	2 900	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*	*12,90*	*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	3 200	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*	*14,24*	*21,71*	*20,86*	*0,0076/ 0,0254*	*0,0025/ 0,0127*	*80,01*	*141,23*
47	0.0010	0.0008	0.0016	0.0010	24 700	5 000	6 600	6 390	0.0003/ 0.0010	0.0001/ 0.0005	16	30
	0,0254	*0,0203*	*0,0406*	*0,0254*	*109,86*	*22,25*	*29,36*	*28,42*	*0,0076/ 0,0254*	*0,0025/ 0,0127*	*112,96*	*211,85*
48	0.0010	0.0008	0.0016	0.0010	27 500	5 500	8 150	7 840	0.0003/ 0.0010	0.0001/ 0.0005	16.67	30
	0,0254	*0,0203*	*0,0406*	*0,0254*	*122,40*	*24,47*	*36,25*	*34,87*	*0,0076/ 0,0254*	*0,0025/ 0,0127*	*117,67*	*211,85*
49	0.0010	0.0008	0.0016	0.0010	27 500	5 500	8 150	7 840	0.0003/ 0.0010	0.0001/ 0.0005	17.33	32
	0,0254	*0,0203*	*0,0406*	*0,0254*	*122,40*	*24,47*	*36,25*	*34,87*	*0,0076/ 0,0254*	*0,0025/ 0,0127*	*122,37*	*225,97*

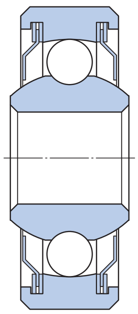
3) For average life of 10 000 complete 90° cycles
4) If G395 load rating is 20% lower
5) Values are valid for bearings with G395. When using G354, values are 20% higher

1.23 Self-aligning ball bearing single row, AS 27645 (Inch dimensions)

KSP.., KSP..A, KSP..L bore code **3L** to **6A**

Technical specification	AS 7949
Product standard	AS 27645





Dimensions

Nominal bore code	Dimensions d	Δdmp		Δds	D	ΔDmp		ΔDs	C	ΔCs	
		Standard	SKF super precision			Standard	Precision			Standard	Precision
–	in/*mm*										
3L	0.1900 *4,286*	0/–0.005 *0/ –0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.6250 *15,875*	0/–0.005 *0/ –0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.203 *5,156*	0/–0.005 *0/ –0,127*	0/–0.005 *0/ –0,127*
4A	0.2500 *6,350*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.7500 *19,050*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.219 *5,562*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
5A	0.3125 *7,938*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.8125 *20,638*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.234 *5,944*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
6A	0.3750 *9,525*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.8750 *22,225*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.250 *6,350*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	Dimensions B	ΔBs		d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	α	Mass ≈	Tolerances Kia max		Kea max	
		Standard	Precision						Standard	Precision	Standard	Precision
–	in/*mm*						°	lb/*g*	in/*mm*			
3L	0.245 *6,223*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.256 *6,502*	0.005 *0,127*	0.016 *0,406*	10	0,01 *5*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
4A	0.281 *7,137*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.328 *8,331*	0.005 *0,127*	0.016 *0,406*	8	0,02 *9*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
5A	0.297 *7,544*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.389 *9,880*	0.015 *0,381*	0.016 *0,406*	8	0,02 *9*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
6A	0.313 *7,950*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.462 *11,735*	0.016 *0,406*	0.016 *0,406*	8	0,03 *14*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*

Designation system

Examples: ZWMKSP6ASK1CP55RP01 / KSP3P — ZW M KSP 6 A SK1 CP55 RP01

Material and surface treatment — ZW

No code	Cadmium plated bearing steel
W[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances — M

No code	Standard tolerances
M[1]	Reduced clearance and SKF super precision

Basic designation — KSP

Bore code (multiples of 1/16th inch) — 6

Variation — A SK1

	Lubricant	Shield and seal	Radial clearance KSP..	Radial clearance MKSP..[1]
SK1	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R	G395	Sealed	Reduced	–
SK1.R	G354	Sealed	Reduced	–
P[1]	G354	Shielded	Standard	Reduced
PG81[1]	G395	Shielded	Standard	Reduced
PG81.R[1]	G395	Shielded	Reduced	–
P.R[1]	G354	Shielded	Reduced	–

Passivation — CP55

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize — RP01

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[1] SKF option

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

Loads, clearance and torque

Nominal bore code	Static limit loads Radial C_s	Static limit loads Axial C_a	Radial dynamic load rating[3][4] Load fixed with respect to outer ring	Radial dynamic load rating[3][4] Load fixed with respect to inner ring	Radial clearance Standard	Radial clearance Reduced	Axial clearance max	Maximum starting torque[5] Shielded	Maximum starting torque[5] Sealed
–	lbf/*kN*		lbf/*kN*		in/*mm*			oz-in/*mNm*	
3L	550	100	550	480	0/ 0.0010	0.0001/ 0.0005	0,023	0.67	1
	2,45	*0,45*	*2,45*	*2,14*	*0/ 0,0254*	*0,0254/ 0,0127*	*0,584*	*4.71*	*7.06*
4A	900	200	900	770	0/ 0.0010	0.0001/ 0.0005	0,025	0.67	1
	4,00	*0,90*	*4,00*	*3,43*	*0/ 0,0254*	*0,0254/ 0,0127*	*0,635*	*4.71*	*7.06*
5A	1 000	200	950	815	0/ 0.0010	0.0001/ 0.0005	0,028	1.33	2
	4,45	*0,90*	*4,23*	*3,63*	*0/ 0,0254*	*0,0254/ 0,0127*	*0,711*	*9.41*	*14.12*
6A	1 120	200	1 120	990	0/ 0.0010	0.0001/ 0.0005	0,03	2	3
	5,00	*0,90*	*4,98*	*4,40*	*0/ 0,0254*	*0,0254/ 0,0127*	*0,762*	*14.12*	*21.18*

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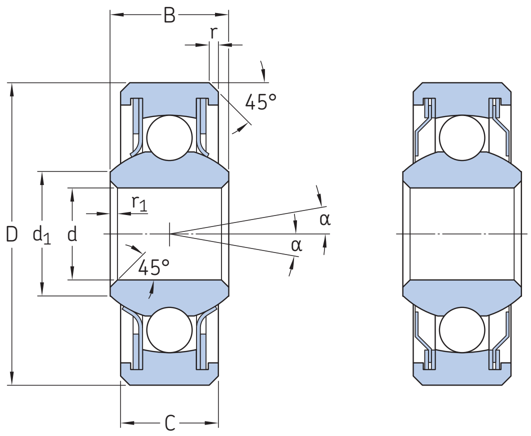
[3] For average life of 10 000 complete 90° cycles

[4] If G395 load rating is 20% lower

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

1.23 Self-aligning ball bearing single row, AS 27645 (Inch dimensions)

KSP.., KSP..A, KSP..L bore code **3** to **10**



Technical specification	AS 7949
Product standard	AS 27645

Dimensions

Nominal bore code	Dimensions d	Δdmp Standard	SKF super precision	Δds	D	ΔDmp Standard	Precision	ΔDs	C	ΔCs Standard	Precision
–	in/*mm*										
3	0.1900 *4,826*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.7774 *19,746*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.270 *6,858*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
4	0.2500 *6,350*	0/–0.005 *0/ –0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.9014 *22,896*	0/–0.005 *0/ –0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.335 *8,509*	0/–0.005 *0/ –0,127*	0/–0.005 *0/ –0,127*
5	0.3125 *7,938*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.2500 *31,750*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.375 *9,525*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
6	0.3750 *9,525*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.4375 *36,512*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.469 *11,913*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
8	0.5000 *12,700*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.6875 *42,862*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.500 *12,700*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
10	0.6250 *15,875*	0/–0.005 *0/–0,127*	0/–0.003 *0/–0,076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.9375 *49,212*	0/–0.005 *0/–0,127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.625 *15,875*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	Dimensions B	ΔBs Standard	Precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	α	Mass ≈	Tolerances Kia max Standard	Precision	Kea max Standard	Precision
–	in/*mm*						°	lb/*g*	in/*mm*			
3	0.297 *7,544*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.297 *7,544*	0.005 *0,127*	0.022 *0,559*	10	0.03 *14*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
4	0.484 *12,294*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.396 *10,058*	0.005 *0,127*	0.032 *0,813*	10	0.04 *18*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
5	0.558 *14,173*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.567 *14,402*	0.015 *0,381*	0.032 *0,813*	10	0.10 *45*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
6	0.620 *15,748*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.612 *15,545*	0.015 *0,381*	0.032 *0,813*	10	0.15 *68*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
8	0.620 *15,748*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.796 *20,218*	0.015 *0,381*	0.044 *1,118*	10	0.23 *104*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
10	0.813 *20,650*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.922 *23,418*	0.015 *0,381*	0.044 *1,118*	10	0.37 *168*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*

Designation system

Examples: ZWMKSP6ASK1CP55RP01
KSP3P

ZW M KSP 6 A SK1 CP55 RP01

Material and surface treatment

No code	Cadmium plated bearing steel
W1)	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW1)	Cadmium plated corrosion-resistant steel
SZW1)	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M1)	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	**Shield and seal**	**Radial clearance**	
			KSP..	**MKSP..**1)
SK1	G354	Sealed	Standard	Reduced
S281	G395	Sealed	Standard	Reduced
S281.R	G395	Sealed	Reduced	–
SK1.R	G354	Sealed	Reduced	–
P1)	G354	Shielded	Standard	Reduced
PG811)	G395	Shielded	Standard	Reduced
PG81.R1)	G395	Shielded	Reduced	–
P.R1)	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP552)	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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

Loads, clearance and torque

Nominal bore code	**Static limit loads** Radial C_s	Axial C_a	**Radial dynamic load rating**3)4) Load fixed with respect to outer ring	inner ring	**Radial clearance** Standard	Reduced	**Axial clearance max**	**Maximum starting torque**5) Shielded	Sealed
–	lbf/*kN*				in/*mm*			oz-in/*mNm*	
3	900 *4,00*	200 *0,90*	900 *4,00*	770 *3,43*	0/ 0.0010 *0/ 0,0254*	0.0001/ 0.0005 *0,0254/ 0,0127*	0.023 *0,584*	0.67 *4.71*	1 *7.06*
4	1 410 *6,30*	300 *1,34*	1 230 *5,47*	1 230 *5,47*	0/ 0.0010 *0/ 0,0254*	0.0001/ 0.0005 *0,0254/ 0,0127*	0.025 *0,635*	0.67 *4.71*	1 *7.06*
5	2 190 *9,80*	300 *1,34*	2 190 *9,74*	1 890 *8,41*	0/ 0.0010 *0/ 0,0254*	0.0001/ 0.0005 *0,0254/ 0,0127*	0.028 *0,711*	1.33 *9.41*	2 *14.12*
6	2 980 *13,20*	400 *1,76*	2 980 *13,26*	2 580 *11,48*	0/ 0.0010 *0/ 0,0254*	0.0001/ 0.0005 *0,0254/ 0,0127*	0.03 *0,762*	2 *14.12*	3 *21.18*
8	3 670 *16,30*	500 *2,24*	3 670 *16,32*	3 290 *14,63*	0/ 0.0010 *0/ 0,0254*	0.0001/ 0.0005 *0,0254/ 0,0127*	0.032 *0,813*	2.67 *18.83*	4 *28.25*
10	5 320 *23,60*	600 *2,65*	4 980 *22,15*	4 360 *19,39*	0/ 0.0010 *0/ 0,0254*	0.0001/ 0.0005 *0,0254/ 0,0127*	0.034 *0,864*	4 *28.25*	5 *35,31*

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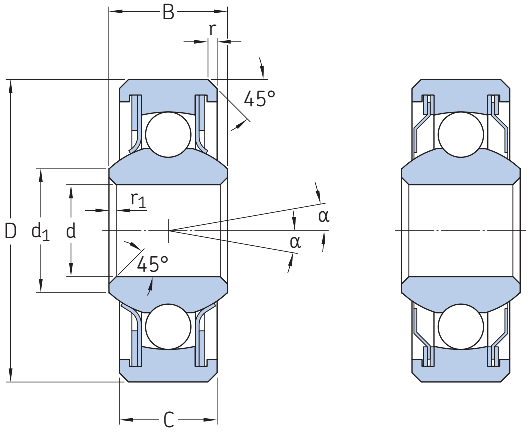
3) For average life of 10 000 complete 90° cycles
4) If G395 load rating is 20% lower
5) Values are valid for bearings with G395. When using G354, values are 20% higher

1.24 Self-aligning ball bearing single row (Inch dimensions)

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

Technical specification	AS 7949
Product standard	–



Dimensions, loads and clearance

Nominal bore code	**Dimensions**								**Mass**	**Static limit load**	**Radial clearance**
	d +0.0002/–0.0003 *+0.001/–0.008*	D +0/–0.005 *+0/–0.013*	C 0/–0.005 *0/–0.013*	B 0/–0.005 *0/–0.013*	d_1 ≈	r_1 Min	r Min	α	≈	Radial C_s	
–	in/*mm*							°	lb/*g*	lbf/*kN*	in/*mm*
3..SP2	0.1898 *4,821*	0.7774 *19,746*	0.2700 *6,858*	0.2970 *7,544*	0.328 *8,331*	0.030 *0,762*	0.030 *0,762*	12	0.026 *12*	890 *3,95*	0/ 0.0005 *0/ 0,0127*
3A..SP3	0.1898 *4,821*	0.6250 *15,875*	0.2030 *5,156*	0.2450 *6,223*	0.257 *6,528*	0.015 *0,381*	0.015 *0,381*	10	0.011 *5*	540 *2,41*	0/ 0.0005 *0/ 0,0127*
3..SP4	0.1898 *4,281*	0,7774 *19,746*	0,2700 *6,858*	0,3750 *9,525*	0,298 *7,569*	0,005 *0,127*	0,022 *0,559*	7	0,026 *12*	890 *3,95*	0/ 0.0005 *0/ 0,0127*
4..SP1	0.2500 *6,350*	0.9014 *22,896*	0.3350 *8,509*	0.4840 *12,294*	0.410 *10,414*	0.040 *1,016*	0.040 *1,016*	12	0.042 *19*	1 390 *6,18*	0/ 0.0005 *0/ 0,0127*
5..SP3	0.3125 *7,937*	1.2500 *31,750*	0.3750 *9,525*	0.5575 *14,160*	0.563 *14,300*	0.040 *1,016*	0.040 *1,016*	10	0.104 *47*	2 170 *9,63*	0/ 0.0005 *0/ 0,0127*
5A..SP4	0.3125 *7,937*	0.8750 *22,225*	0.3125 *7,937*	0.6250 *15,875*	0.415 *10,541*	0.016 *0,406*	0.016 *0,406*	10	0.037 *17*	1 270 *5,66*	0/ 0.0005 *0/ 0,0127*
5A..SP5	0.3125 *7,937*	0,8750 *22,225*	0,3125 *7,937*	0,5200 *13,208*	0,415 *10,541*	0,016 *0,406*	0,016 *0,406*	10	0,035 *16*	1 270 *5,66*	0/ 0.0005 *0/ 0,0127*
6..SP1	0.3750 *9,525*	1.4375 *36,512*	0.4688 *11,907*	0.6200 *15,748*	0.688 *17,475*	0.040 *1,016*	0.040 *1,016*	10	0.156 *71*	3 550 *15,81*	0/ 0.0005 *0/ 0,0127*
6A..SP2	0.3748 *9,520*	0.8750 *22,225*	0.2500 *6,350*	0.3130 *7,950*	0.475 *12,065*	0.025 *0,635*	0.025 *0,635*	9	0.03 *14*	1 110 *4,94*	0/ 0.0007 *0/ 0,0178*
8..SP1	0.5000 *12,700*	1.6875 *42,862*	0.5000 *12,700*	0.6200 *15,748*	0.854 *21,692*	0.047 *1,194*	0.047 *1,194*	10	0.236 *107*	4 150 *18,44*	0/ 0.0007 *0/ 0,0178*
10..SP1	0.6250 *15,875*	1.9375 *49,212*	0.6250 *15,875*	0.8125 *20,637*	1.000 *25,400*	0.047 *1,194*	0.047 *1,194*	12	0.379 *172*	5 620 *25,01*	0/ 0.0007 *0/ 0,0178*

Designation system

Examples: ZWKSP6APSP2G81CP55RP01
KSP10SP1

ZW KSP 6 A P SP2 G81 CP55 RP01

Material and surface treatment

No code	Cadmium plated bearing 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 1/16th inch)

Shield and seal

No code	Sealed
P	Shielded

Lubricant

No code	Grease G354
G81	Grease G395

Passivation

No code	Not treated
CP55[1]	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

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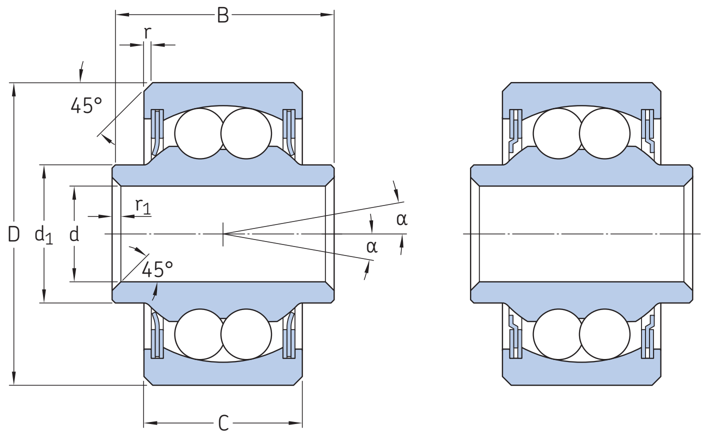
1) Available only for corrosion-resistant steel material without other surface treatment

1.25 Self-aligning ball bearing double row (Inch dimensions)

KN..

Technical specification	–
Product standard	–



Dimensions

Nominal bore code	**Dimensions** d	Δdmp	D	ΔDmp	C	ΔCs	B	ΔBs	d1 ≈	r1 +0.012/–0.003 *+0,305/–0.076*	r +0.012/–0.003 *+0,305/–0.076*	α
–	in/*mm*											°
4,83	0.1900 *4,826*	0/–0.005 *0/–0,127*	0.6300 *16,000*	0/–0.003 *0/ –0,76*	0.315 *8,001*	0/–0.0039 *0/ –0,0991*	0.472 *11,989*	0/–0.0039 *0/–0,0991*	0.299 *7,595*	0.020 *0,508*	0.020 *0,508*	7
6,35	0.2500 *6,350*	0/–0.005 *0/–0,127*	0.7480 *18,999*	0/–0.035 *0/–0,089*	0.394 *10*	0/–0.0039 *0/ –0,0991*	0.551 *13,995*	0/–0.0039 *0/–0,0991*	0.323 *8,204*	0.020 *0,508*	0.020 *0,508*	7
7,94	0.3125 *7,937*	0/–0.005 *0/–0,127*	0.9448 *23,998*	0/–0.035 *0/–0,089*	0.394 *10,008*	0/–0.0039 *0/ –0,0991*	0.591 *15,011*	0/–0.0039 *0/–0,0991*	0.437 *11,100*	0.020 *0,508*	0.020 *0,508*	7
9,52	0.3750 *9,525*	0/–0.005 *0/–0,127*	1.1811 *30*	0/–0.035 *0/–0,089*	0.551 *13,995*	0/–0.0039 *0/ –0,0991*	0.787 *20,000*	0/–0.0039 *0/–0,0991*	0.535 *13,589*	0.020 *0,508*	0.020 *0,508*	7
12,7	0.5000 *12,700*	0/–0.005 *0/–0,127*	1.2598 *31,999*	0/–0.043 *0/–0,101*	0.551 *13,995*	0/–0.0039 *0/ –0,0991*	0.787 *20,000*	0/–0.0039 *0/–0,0991*	0.606 *15,392*	0.020 *0,508*	0.020 *0,508*	7
15,87	*0.6250* *15,875*	0/–0.005 *0/–0,127*	*1.3780* *35,001*	0/–0.043 *0/–0,101*	*0.551* *13,995*	0/–0.0039 *0/ –0,0991*	*0.787* *20,000*	0/–0.0039 *0/ –0,0991*	0.728 *18,491*	0.020 *0,508*	0.020 *0,508*	7

Tolerances, loads, clearance and torque

Nominal bore code	**Mass** ≈	**Tolerances** Kia max	Kea max	**Static limit loads** Radial C_s	Axial C_a	**Clearances** Axial	Radial	**Maximum starting torque** Shielded	Sealed	**Max. swivelling torque**
–	lb/*g*	in/*mm*		lbf/*kN*		in/*mm*		oz-in/*mNm*		
4,83	0.020 *9*	0.0010 *0,025*	0.0016 *0,040*	877 *3,90*	270 *1,20*	0.0027 *0,0686*	0.00024 *0,0061*	0.568 *4,01*	1.136 *8,02*	14.2 *0,10*
6,35	0.031 *14*	0.0010 *0,025*	0.0016 *0,040*	1 326 *6,00*	405 *1,80*	0.0027 *0,0686*	0.00024 *0,0061*	0.639 *4,51*	1.278 *9,02*	14.2 *0,10*
7,94	0.066 *30*	0.0010 *0,025*	0.0016 *0,040*	2 203 *9,80*	674 *3,00*	0.0031 *0,0787*	0.00028 *0,0071*	0.781 *5,51*	1.416 *10,00*	14.2 *0,10*
9,52	0.126 *57*	0.0010 *0,025*	0.0016 *0,040*	3 192 *14,20*	1 012 *4,50*	0.0031 *0,0 787*	0.00028 *0,0071*	1.065 *7,52*	1.704 *12,03*	14.2 *0,10*
12,7	0.137 *62*	0.0010 *0,025*	0.0016 *0,040*	3 754 *16,70*	1 169 *5,20*	0.0031 *0,0787*	0.00035 *0,0089*	1.278 *9,02*	1.988 *14,03*	14.2 *0,10*
15,87	*0.165* *75*	0.0010 *0,025*	0.0016 *0,040*	*4 272* *19,00*	*1 326* *5,90*	0.0031 *0,0787*	0.00035 *0,0089*	*1.704* *12,03*	*2.556* *18,05*	*14.2* *0,10*

Designation system

Examples: ZWKN6,35SK1CP55RP01
KN12,7

Z W KN 6,35 SK1 CP55 RP01

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 (multiples of 1/16th inch)

Variation

	Lubricant	**Version**
No code	G354	Shielded
G81	G395	Shielded
S181	G395	Sealed
SK1	G354	Sealed

Passivation

No code	Not treated
CP55 1)	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

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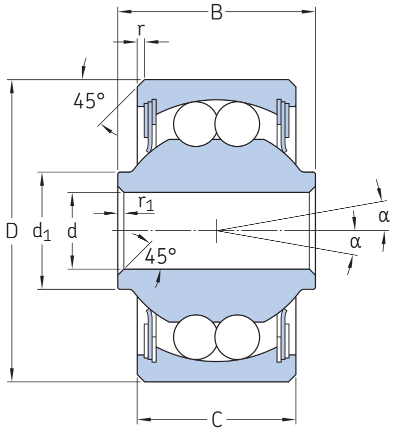
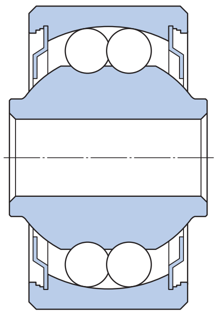
1) Available only for corrosion-resistant steel material without other surface treatment

1.26 Self-aligning ball bearing double row, AS 27643 (Inch dimensions)

DSP..





Technical specification	AS 7949
Product standard	AS 27643

Dimensions

Nominal bore code	Dimensions										
	d	Δdmp Standard	SKF super precision	Δds	D	ΔDmp Standard	SKF super precision	ΔDs	C	ΔCs Standard	SKF super precision
–	in/*mm*										
3	0.1900 *4,826*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.7774 *19,745*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.392 *9,957*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
4	0.2500 *6,350*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	0.9014 *22,895*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.464 *11,785*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
5	0.3125 *7,937*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.2500 *31,750*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.656 *16,662*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
6	0.3750 *9,525*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.4375 *36,512*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.750 *19,050*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
8	0.5000 *12,700*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.6875 *42,862*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.812 *20,624*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*
10	0.6250 *15,875*	0/–0.0005 *0/–0,0127*	0/–0.0003 *0/–0,0076*	+0.0002/–0.0007 *+0,0050/–0,0178*	1.9375 *49,212*	0/–0.0005 *0/–0,0127*	0/–0.0004 *0/–0,0101*	+0.0005/–0.0010 *+0,0127/–0,0254*	0.937 *23,799*	0/–0.005 *0/–0,127*	0/–0.005 *0/–0,127*

Dimensions cont. and tolerances

Nominal bore code	Dimensions							Mass	Tolerances			
	B	ΔBs Standard	SKF super precision	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	α	≈	Kia max Standard	SKF super precision	Kea max Standard	SKF super precision
–	in/*mm*						°	lb/*g*	in/*mm*			
3	0.500 *12,700*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.304 *7,721*	0.005 *0,127*	0.022 *0,559*	10	0,04 *18*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
4	0.687 *17,449*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.430 *10,922*	0.005 *0,127*	0.032 *0,813*	10	0,06 *27*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
5	0.812 *20,624*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.515 *13,081*	0.015 *0,381*	0.032 *0,813*	10	0,16 *73*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
6	0.937 *23,799*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.564 *14,325*	0.015 *0,381*	0.032 *0,813*	10	0,24 *109*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
8	1.000 *25,400*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.775 *19,685*	0.015 *0,381*	0.044 *1,118*	10	0,36 *163*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*
10	1.125 *28,575*	0/–0.005 *0/–0,127*	0/–0.0025 *0/–0,0635*	0.869 *22,072*	0.015 *0,381*	0.044 *1,118*	10	0,53 *240*	0.0010 *0,0254*	0.0005 *0,0127*	0.0016 *0,0406*	0.0008 *0,0203*

Designation system

Examples: ZWMDSP10SK1CP55RP01
DSP4P

ZW M DSP 10 SK1 CP55 RP01

Material and surface treatment

No code	Cadmium plated bearing steel
W[1]	Corrosion-resistant steel
S	Zinc-nickel plated bearing steel
ZW[1]	Cadmium plated corrosion-resistant steel
SZW[1]	Zinc-nickel plated corrosion-resistant steel

Tolerances

No code	Standard tolerances
M[1]	Reduced clearance and SKF super precision

Basic designation

Bore code (multiples of 1/16th inch)

Variation

	Lubricant	Version	Radial clearance DSP..	MDSP..[1]
SK1	G354	Sealed	Standard	Reduced
S181	G395	Sealed	Standard	Reduced
S181-R	G395	Sealed	Reduced	–
SK1-R	G354	Sealed	Reduced	–
P[1]	G354	Shielded	Standard	Reduced
PG81[1]	G395	Shielded	Standard	Reduced
PG81.R[1]	G395	Shielded	Reduced	–
P.R[1]	G354	Shielded	Reduced	–

Passivation

No code	Not treated
CP55[2]	Passivated corrosion-resistant steel

Oversize

No code	Standard outer diameter size
RP01[1]	0.010 in/0,254 mm oversized outer diameter
RP02[1]	0.020 in/0,508 mm oversized outer diameter

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[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 C_s	Axial C_a	Radial dynamic load rating[3][4] Load fixed with respect to outer ring	inner ring	Radial clearance Standard	Reduced	Axial clearance max	Maximum starting torque[5] Shielded	Sealed
–	lbf/*kN*		lbf/*kN*		in/*mm*			oz.in/*mNm*	
3	1 420 *6,32*	200 *0,88*	1 420 *6,32*	1 220 *5,43*	0/ 0.0010 *0/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.0055 *0,140*	0.67 *4,71*	1 *7,06*
4	1 780 *7,92*	300 *1,33*	1 780 *7,92*	1 600 *7,12*	0/ 0.0010 *0/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.0055 *0,140*	0.67 *4,71*	1 *7,06*
5	3 740 *16,64*	600 *2,66*	3 470 *15,44*	3 300 *14,68*	0/ 0.0010 *0/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.006 *0,152*	1.33 *9,41*	3 *21.18*
6	5 100 *22,68*	800 *3,55*	4 980 *22,15*	4 370 *19,44*	0/ 0.0010 *0/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.006 *0,152*	1.33 *9,41*	4 *28,25*
8	7 120 *31,68*	1 000 *4,44*	6 340 *28,20*	5 570 *24,78*	0/ 0.0010 *0/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.007 *0,178*	1.33 *9,41*	5 *35,31*
10	9 000 *40,04*	1 300 *5,77*	7 780 *34,61*	6 860 *30,51*	0/ 0.0010 *0/ 0,0254*	0.0002/ 0.0005 *0,0051/ 0,0127*	0.007 *0,178*	2 *14,12*	6 *42,37*

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[3] For average life of 10 000 complete 90° cycles

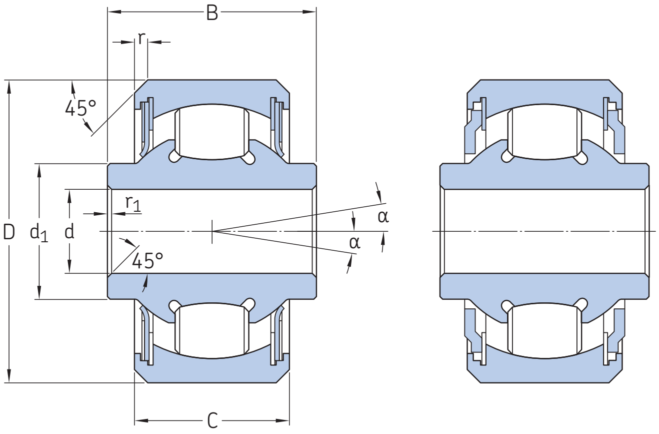
[4] If G395 load rating is 20% lower

[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	AS 7949
Product standard	–



Dimensions

Nominal bore code	Dimensions d	Δdmp	D	ΔDmp	C	ΔCs	B	ΔBs	d_1 ≈	r_1 +0.015/0 *+0,381/0*	r +0.015/0 *+0,381/0*	α
–	in/*mm*											°
4	0.2500 *6,350*	0/–0.005 *0/–0,127*	0.9014 *22,895*	0/–0.005 *0/–0,127*	0.464 *11,785*	0/–0.005 *0/–0,127*	0.625 *15,875*	0/–0.005 *0/–0,127*	0.404 *10,260*	0.005 *0,127*	0.032 *0,813*	10
5	0.3125 *7,937*	0/–0.005 *0/–0,127*	1.2500 *31,750*	0/–0.005 *0/–0,127*	0.656 *16,662*	0/–0.005 *0/–0,127*	0.812 *20,624*	0/–0.005 *0/–0,127*	0.515 *13,081*	0.015 *0,381*	0.032 *0,813*	10
6	0.3750 *9,525*	0/–0.005 *0/–0,127*	1.4375 *36,512*	0/–0.005 *0/–0,127*	0.750 *19,050*	0/–0.005 *0/–0,127*	0.937 *23,799*	0/–0.005 *0/–0,127*	0.564 *14,325*	0.015 *0,381*	0.032 *0,813*	10
8	0.5000 *12,700*	0/–0.005 *0/–0,127*	1.6875 *42,862*	0/–0.005 *0/–0,127*	0.812 *20,624*	0/–0.005 *0/–0,127*	1.000 *25,400*	0/–0.005 *0/–0,127*	0.775 *19,685*	0.015 *0,381*	0.044 *1,118*	10
10	0.6250 *15,875*	0/–0.005 *0/–0,127*	1.9375 *49,212*	0/–0.005 *0/–0,127*	0.937 *23,799*	0/–0.005 *0/–0,127*	1.125 *28,575*	0/–0.005 *0/–0,127*	0.869 *22,072*	0.015 *0,381*	0.044 *1,118*	10
12	*0.7500* *19,050*	0/–0.005 *0/–0,127*	*2.3750* *60,325*	0/–0.005 *0/–0,127*	*1.125* *28,580*	0/–0.005 *0/–0,127*	*1.312* *33,320*	0/–0.005 *0/–0,127*	1.150 *29,210*	0.015 *0,381*	0.044 *1,118*	10

Tolerances, loads and clearance

Nominal bore code	Mass ≈	Tolerances Kia max	Kea max	Static limit loads Radial C_s	Axial C_a	Radial clearance
–	lb/*g*	in/*mm*		lbf/*kN*		in/*mm*
4.83	0.06 *27*	0.0010 *0,0254*	0.0016 *0,0406*	3 025 *13,40*	907,50 *4,02*	0.0004/ 0.0010 *0,0101/ 0,0254*
6.35	0.16 *73*	0.0010 *0,0254*	0.0016 *0,0406*	7 350 *32,50*	2 205 *9,75*	0.0004/ 0.0010 *0,0101/ 0,0254*
7.94	0.24 *109*	0.0010 *0,0254*	0.0016 *0,0406*	9 600 *42,50*	2 880 *12,75*	0.0004/ 0.0010 *0,0101/ 0,0254*
9.52	0.36 *163*	0.0010 *0,0254*	0.0016 *0,0406*	12 500 *56,00*	3 750 *16,80*	0.0004/ 0.0010 *0,0101/ 0,0254*
12.7	0.55 *249*	0.0010 *0,0254*	0.0016 *0,0406*	17 700 *78,00*	5 310 *23,40*	0.0004/ 0.0010 *0,0101/ 0,0254*
15.87	*1.05* *476*	0.0010 *0,0254*	0.0016 *0,0460*	*26 900* *120,00*	*8 070* *36,00*	0.0004/ 0.0010 *0,0101/ 0,0254*

Designation system

Examples: ZWDSRP10SK1CP55RP01
DSRP4P

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 1/16th inch)

Variation

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

Passivation

No code	Not treated
CP55[1]	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

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[1] Available only for corrosion-resistant steel material without other surface treatment

Cross-reference

Metric bearings

EN part number	SKF designation
EN3045A**d**P	JNA**d**DN744
EN3045A**d**E	JNA**d**EDN744
EN3045B**d**P	JNA**d**DN814
EN3045B**d**E	JNA**d**EDN814
EN3046A**d**P	ZJNA**d**DN744
EN3046A**d**E	ZJNA**d**EDN744
EN3046B**d**P	ZJNA**d**DN814
EN3046B**d**E	ZJNA**d**EDN814
EN3047A**d**P	WJNA**d**DN744
EN3047A**d**E	WJNA**d**EDN744
EN3047B**d**P	WJNA**d**DN814
EN3047B**d**E	WJNA**d**EDN814
EN3284A**d**P	JNA**d**N743
EN3284A**d**E	JNA**d**EN743
EN3284B**d**P	JNA**d**N813
EN3284B**d**E	JNA**d**EN813
EN3285A**d**P	ZJNA**d**N743
EN3285A**d**E	ZJNA**d**EN743
EN3285B**d**P	ZJNA**d**N813
EN3285B**d**E	ZJNA**d**EN813
EN3286A**d**P	WJNA**d**N743
EN3286A**d**E	WJNA**d**EN743
EN3286B**d**P	WJNA**d**N813
EN3286B**d**E	WJNA**d**EN813

Where
d = Bore code

Example

EN part number	SKF designation
EN3045A**6**P	JNA**6**DN744
EN3046A**10**E	ZJNA**10**EDN744
EN3284B**15**P	JNA**15**N813
EN3286B**25**E	WJNA**25**EN813

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

Where
d = Bore code

Example

EN part number	SKF designation
EN4033B**10**P	WATA**10**N815
EN4033B**17**PT	WATA**17**N815CP55
EN3281A**25**E	TA**25**EN743
EN3283B**40**E	WATA**40**EN813

EN part number	SKF designation
EN3056A**d**P	AGN**d**
EN3056A**d**E	AGN**d**E
EN3056B**d**P	AGN**d**G81
EN3056B**d**E	AGN**d**EG81
EN3057A**d**P	ZAGN**d**
EN3057A**d**E	ZAGN**d**E
EN3057B**d**P	ZAGN**d**G81
EN3057B**d**E	ZAGN**d**EG81
EN3058A**d**P	WAGN**d**
EN3058A**d**E	WAGN**d**E
EN3058B**d**P	WAGN**d**G81
EN3058B**d**E	WAGN**d**EG81

Where
d = Bore code

Example

EN part number	SKF designation
EN3056A**8**P	AGN**8**
EN3057B**12**P	ZAGN**12**G81
EN3058B**20**E	WAGN**20**EG81

EN part number	SKF designation
EN3059A**d**PC	TRCE**d**TN741
EN3059A**d**PD	TRCE**d**TCN741
EN3059A**d**EC	TRCE**d**EN741
EN3059A**d**ED	TRCE**d**ECN741
EN3059B**d**PC	TRCE**d**TN811
EN3059B**d**PD	TRCE**d**TCN811
EN3059B**d**EC	TRCE**d**EN811
EN3059B**d**ED	TRCE**d**ECN811
EN3060A**d**PC	ZTRCE**d**TN741
EN3060A**d**PD	ZTRCE**d**TCN741
EN3060A**d**EC	ZTRCE**d**EN741
EN3060A**d**ED	ZTRCE**d**ECN741
EN3060B**d**PC	ZTRCE**d**TN811
EN3060B**d**PD	ZTRCE**d**TCN811
EN3060B**d**EC	ZTRCE**d**EN811
EN3060B**d**ED	ZTRCE**d**ECN811
EN3061A**d**PC	XTRCE**d**TN741
EN3061A**d**PD	XTRCE**d**TCN741
EN3061A**d**EC	XTRCE**d**EN741
EN3061A**d**ED	XTRCE**d**ECN741
EN3061B**d**PC	XTRCE**d**TN811
EN3061B**d**PD	XTRCE**d**TCN811
EN3061B**d**EC	XTRCE**d**EN811
EN3061B**d**ED	XTRCE**d**ECN811
EN3061A**d**PCT	XTRCE**d**TN741CP55
EN3061A**d**PDT	XTRCE**d**TCN741CP55
EN3061A**d**ECT	XTRCE**d**EN741CP55
EN3061A**d**EDT	XTRCE**d**ECN741CP55
EN3061B**d**PCT	XTRCE**d**TN811CP55
EN3061B**d**PDT	XTRCE**d**TCN811CP55
EN3061B**d**ECT	XTRCE**d**EN811CP55
EN3061B**d**EDT	XTRCE**d**ECN811CP55

Where
d = Bore code

Example

EN part number	SKF designation
EN3059A**16**PC	TRCE**16**TN741
EN3060A**25**ED	ZTRCE**25**ECN741
EN3061B**40**PD	XTRCE**40**TCN811
EN3061B**50**PDT	XTRCE**50**TCN811CP55

Metric bearings

EN part number	SKF designation
EN4041A**d**PC	XTRCEI**d**TN741
EN4041A**d**PD	XTRCEI**d**TCN741
EN4041A**d**EC	XTRCEI**d**EN741
EN4041A**d**ED	XTRCEI**d**ECN741
EN4041B**d**PC	XTRCEI**d**TN811
EN4041B**d**PD	XTRCEI**d**TCN811
EN4041B**d**EC	XTRCEI**d**EN811
EN4041B**d**ED	XTRCEI**d**ECN811
EN4041A**d**PCT	XTRCEI**d**TN741CP55
EN4041A**d**PDT	XTRCEI**d**TCN741CP55
EN4041A**d**ECT	XTRCEI**d**EN741CP55
EN4041A**d**EDT	XTRCEI**d**ECN741CP55
EN4041B**d**PCT	XTRCEI**d**TN811CP55
EN4041B**d**PDT	XTRCEI**d**TCN811CP55
EN4041B**d**ECT	XTRCEI**d**EN811CP55
EN4041B**d**EDT	XTRCEI**d**ECN811CP55

Where
d = Bore code

Example

EN part number	SKF designation
EN4041A**35**PC	XTRCEI**35**TN741
EN4041A**45**PCT	XTRCEI**45**TN741CP55

EN part number	SKF designation
EN4034A**d**P	WKNRCE**d**N743[1]
EN4034A**d**E	WKNRCE**d**EN743[1]
EN4034B**d**P	WKNRCE**d**N813[1]
EN4034B**d**E	WKNRCE**d**EN813[1]
EN4034A**d**PT	WKNRCE**d**N743CP55[1]
EN4034A**d**ET	WKNRCE**d**EN743CP55[1]
EN4034B**d**PT	WKNRCE**d**N813CP55[1]
EN4034B**d**ET	WKNRCE**d**EN813CP55[1]

Where
d = Bore code
[1] Except d = 35 and d = 40

Example

EN part number	SKF designation
EN4034A**16**P	WKNRCE**16**N743
EN4034A**16**PT	WKNRCE**16**N743CP55

EN part number	SKF designation
EN3287AR**d**P	KN**d'**N745
EN3287AR**d**E	KN**d**EN745
EN3287AN**d**P	KN**d'**N743
EN3287AN**d**E	KN**d**EN743
EN3287AL**d**P	KN**d'**N746
EN3287AL**d**E	KN**d**EN746
EN3287BR**d**P	KN**d'**N815
EN3287BR**d**E	KN**d**EN815
EN3287BN**d**P	KN**d'**N813
EN3287BN**d**E	KN**d**EN813
EN3287BL**d**P	KN**d'**N816
EN3287BL**d**E	KN**d**EN816
EN3288AR**d**P	ZKN**d'**N745
EN3288AR**d**E	ZKN**d**EN745
EN3288AN**d**P	ZKN**d'**N743
EN3288AN**d**E	ZKN**d**EN743
EN3288AL**d**P	ZKN**d'**N746
EN3288AL**d**E	ZKN**d**EN746
EN3288BR**d**P	ZKN**d'**N815
EN3288BR**d**E	ZKN**d**EN815
EN3288BN**d**P	ZKN**d'**N813
EN3288BN**d**E	ZKN**d**EN813
EN3288BL**d**P	ZKN**d'**N816
EN3288BL**d**E	ZKN**d**EN816
EN3289AR**d**P	WKN**d'**N745
EN3289AR**d**E	WKN**d**EN745
EN3289AN**d**P	WKN**d'**N743
EN3289AN**d**E	WKN**d**EN743
EN3289AL**d**P	WKN**d'**N746
EN3289AL**d**E	WKN**d**EN746
EN3289BR**d**P	WKN**d'**N815
EN3289BR**d**E	WKN**d**EN815
EN3289BN**d**P	WKN**d'**N813
EN3289BN**d**E	WKN**d**EN813
EN3289BL**d**P	WKN**d'**N816
EN3289BL**d**E	WKN**d**EN816

Where
d = **d'** = Bore code, except for d = 8, d' = 8/24

Example

EN part number	SKF designation
EN3287AR**5**P	KN**5**N745
EN3288AL**10**E	ZKN**10**EN746
EN3289BN**17**P	WKN**17**N813

EN part number	SKF designation	
EN3053A**d**P	K**d**FN743	KN**d**FN743 (For **d** = 12 and **d** = 15)
EN3053A**d**P1	KN**d**FN743 (Except for **d** = 12 and **d** = 15)	
EN3053B**d**P	K**d**FN813	KN**d**FN813 (For **d** = 12 and **d** = 15)
EN3053B**d**P1	KN**d**FN813 (Except for **d** = 12 and **d** = 15)	
EN3054A**d**P	ZK**d**FN743	ZKN**d**FN743 (For **d** = 12 and **d** = 15)
EN3054AdP1	ZKN**d**FN743 (Except for **d** = 12 and **d** = 15)	
EN3054BdP	ZK**d**FN813	ZKN**d**FN813 (For **d** = 12 and **d** = 15)
EN3054B**d**P1	ZKN**d**FN813 (Except for **d** = 12 and **d** = 15)	
EN3055A**d**P	WK**d**FN743	WKN**d**FN743 (For **d** = 12 and **d** = 15)
EN3055A**d**P1	WKN**d**FN743 (Except for **d** = 12 and **d** = 15)	
EN3055B**d**P	WK**d**FN813	WKN**d**FN813 (For **d** = 12 and **d** = 15)
EN3055B**d**P1	WKN**d**FN813 (Except for **d** = 12 and **d** = 15)	

Where
d = Bore code

Example

EN part number	SKF designation
EN3053A**10**P	K**10**FN743
EN3053A**12**P	KN**12**FN743
EN3053A**10**P1	KN**10**FN743
EN3054B**6**P	ZK**6**FN813
EN3054B**15**P	ZKN**15**FN813
EN3054B**10**P1	ZKN**10**FN813
EN3055A**8**P	WK**8**FN743
EN3055A**12**P	WKN**12**FN743
EN3055A**10**P1	WKN**10**FN743

EN part number	SKF designation
EN3290AK**d**P	KNA**d**FN743
EN3290AK**d**E	KNA**d**FEN743
EN3290AR**d**P	KNA**d**FN745
EN3290AR**d**E	KNA**d**FEN745
EN3290BK**d**P	KNA**d**FN813
EN3290BK**d**E	KNA**d**FEN813
EN3290BR**d**P	KNA**d**FN815
EN3290BR**d**E	KNA**d**FEN815
EN3291AK**d**P	ZKNA**d**FN743
EN3291AK**d**E	ZKNA**d**FEN743
EN3291AR**d**P	ZKNA**d**FN745
EN3291AR**d**E	ZKNA**d**FEN745
EN3291BK**d**P	ZKNA**d**FN813
EN3291BK**d**E	ZKNA**d**FEN813
EN3291BR**d**P	ZKNA**d**FN815
EN3291BR**d**E	ZKNA**d**FEN815
EN3292AK**d**P	WKNA**d**FN743
EN3292AK**d**E	WKNA**d**FEN743
EN3292AR**d**P	WKNA**d**FN745
EN3292AR**d**E	WKNA**d**FEN745
EN3292BK**d**P	WKNA**d**FN813
EN3292BK**d**E	WKNA**d**FEN813
EN3292BR**d**P	WKNA**d**FN815
EN3292BR**d**E	WKNA**d**FEN815

Where
d = Bore code

Example

EN part number	SKF designation
EN3290AK**10**P	KNA**10**FN743
EN3291AR**17**P	ZKNA**17**FN745
EN3292BR**20**E	WKNA**20**FEN815

Inch bearings

AS part number	SKF designation
M27640-**d**GE	SKP**d**SK2
M27640-**d**G	KP**d**SK2
M27640-**d**E	SKP**d**S281
M27640-**d**	KP**d**S281
M27640-**d**RGE	SKP**d**SK2-R
M27640-**d**RG	KP**d**SK2-R
M27640-**d**RE	SKP**d**S281-R
M27640-**d**R	KP**d**S281-R
M27640-3AGE	SKP3LSK2
M27640-3AG	KP3LSK2
M27640-3AE	SKP3LS281
M27640-3A	KP3LS281
M27640-3ARGE	SKP3LSK2-R
M27640-3ARG	KP3LSK2-R
M27640-3ARE	SKP3LS281-R
M27640-3AR	KP3LS281-R

Where
d = Bore code

Example

EN part number	SKF designation
M27640-**5**GE	SKP**5**SK2
M27640-**3**ARGE	SKP**3**LSK2-R

AS part number	SKF designation
M27641-**d**GE	SKP**d**ASK2
M27641-**d**G	KP**d**ASK2
M27641-**d**E	SKP**d**AS281
M27641-**d**	KP**d**AS281
M27641-**d**RGE	SKP**d**ASK2-R
M27641-**d**RG	KP**d**ASK2-R
M27641-**d**RE	SKP**d**AS281-R
M27641-**d**R	KP**d**AS281-R

Where
d = Bore code

Example

EN part number	SKF designation
M27641-**10**RGE	SKP**10**ASK2-R

AS part number	SKF designation
M27642-**d**GE	SKP**d**BSK2
M27642-**d**G	KP**d**BSK2
M27642-**d**E	SKP**d**BS281
M27642-**d**	KP**d**BS281
M27642-**d**SGE	SMKP**d**BSK2
M27642-**d**SG	MKP**d**BSK2
M27642-**d**SE	SMKP**d**BS281
M27642-**d**S	MKP**d**BS281

Where
d = Bore code

Example

EN part number	SKF designation
M27642-**23**SGE	SMKP**23**BSK2

AS part number	SKF designation
M27646-**d**GE	SB5**d**DDSK2
M27646-**d**G	B5**d**DDSK2
M27646-**d**E	SB5**d**DDS281
M27646-**d**	B5**d**DDS281
M21428-**d**GE	SMB5**d**DDSK2
M21428-**d**G	MB5**d**DDSK2
M21428-**d**E	SMB5**d**DDS281
M21428-**d**	MB5**d**DDS281

Where
5**d** = Bore code from product B500 **page 82**

Example

EN part number	SKF designation
M27646-**40**GE	SB5**40**DDSK2
M21428-**44**	MB5**44**DDS281

AS part number	SKF designation
M27644-**d**GE	SDPP**d**SK2
M27644-**d**G	DPP**d**SK2
M27644-**d**E	SDPP**d**S281
M27644-**d**	DPP**d**S281

Where
d = Bore code

Example

EN part number	SKF designation
M27644-**6**GE	SDPP**6**SK2

AS part number	SKF designation
M27647-**d**RLE1)	SDW**d**SK2-R1)
M27647-**d**RL1)	DW**d**SK2-R1)
M27647-**d**RE1)	SDW**d**S281-R1)
M27647-**d**R1)	DW**d**S281-R1)
M27647-**d**LE1)	SDW**d**SK21)
M27647-**d**L1)	DW**d**SK21)
M27647-**d**E1)	SDW**d**S2811)
M27647-**d**1)	DW**d**S2811)
M27647-4RLE	SDW4KSK2-R
M27647-4RL	DW4KSK2-R
M27647-4RE	SDW4KS281-R
M27647-4R	DW4KS281-R
M27647-4LE	SDW4KSK2
M27647-4L	DW4KSK2
M27647-4E	SDW4KS281
M27647-4	DW4KS281
M27647-4ARLE	SDW4K2SK2-R
M27647-4ARL	DW4K2SK2-R
M27647-4ARE	SDW4K2S281-R
M27647-4AR	DW4K2S281-R
M27647-4ALE	SDW4K2SK2
M27647-4AL	DW4K2SK2
M27647-4AE	SDW4K2S281
M27647-4A	DW4K2S281

Where
d = Bore code
1) Except **d** = 4

Example

EN part number	SKF designation
M27647-**5**RLE	SDW**5**SK2-R
M27647-**4**	DW**4**KS281
M27647-**4**AE	SDW**4**K2S281

Inch bearings

AS part number	SKF designation
M27648-**d**GE	SKP**d**BSSK2
M27648-**d**G	KP**d**BSSK2
M27648-**d**E	SKP**d**BSS281
M27648-**d**	KP**d**BSS281

Where
d = Bore code

Example

EN part number	SKF designation
M27648-**21**GE	SKP**21**BSSK2

AS part number	SKF designation
M27645-**d**RGE	SKSP**d**SK2-R
M27645-**d**RG	KSP**d**SK2-R
M27645-**d**RE	SKSP**d**S281-R
M27645-**d**R	KSP**d**S281-R
M27645-**d**GE	SKSP**d**SK2
M27645-**d**G	KSP**d**SK2
M27645-**d**E	SKSP**d**S281
M27645-**d**	KSP**d**S281
M27645-**d**ARGE1)	SKSP**d**ASK2-R
M27645-**d**ARG1)	KSP**d**ASK2-R
M27645-**d**ARE1)	SKSP**d**AS281-R
M27645-**d**AR1)	KSP**d**AS281-R
M27645-**d**AGE1)	SKSP**d**ASK2
M27645-**d**AG1)	KSP**d**ASK2
M27645-**d**AE1)	SKSP**d**AS281
M27645-**d**A1)	KSP**d**AS281
M27645-3ARGE	SKSP3LSK2-R
M27645-3ARG	KSP3LSK2-R
M27645-3ARE	SKSP3LS281-R
M27645-3AR	KSP3LS281-R
M27645-3AGE	SKSP3LSK2
M27645-3AG	KSP3LSK2
M27645-3AE	SKSP3LS281
M27645-3A	KSP3LS281

Where
d = Bore code
1) Except d = 3

Example

EN part number	SKF designation
M27645-**8**RGE	SKSP**8**SK2-R
M27645-**5**AGE	SKSP**5**ASK2
M27645-**3**AG	KSP**3**LSK2

AS part number	SKF designation
M27643-**d**RGE	SDSP**d**SK1-R
M27643-**d**RG	DSP**d**SK1-R
M27643-**d**RE	SDSP**d**S181-R
M27643-**d**R	DSP**d**S181-R
M27643-**d**GE	SDSP**d**SK1
M27643-**d**G	DSP**d**SK1
M27643-**d**E	SDSP**d**S181
M27643-**d**	DSP**d**S181

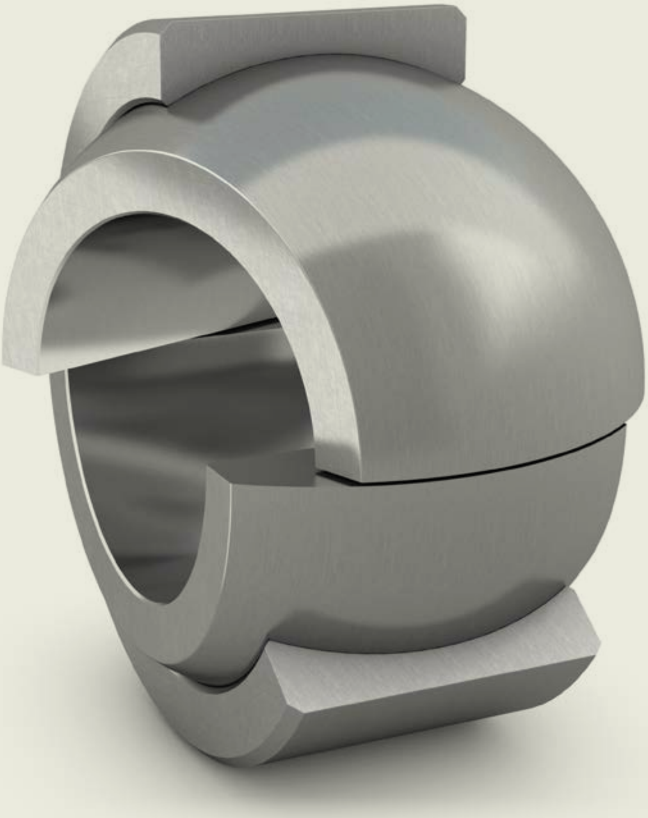
Where
d = Bore code

Example

EN part number	SKF designation
M27643-**6**RGE	SDSP**6**SK1-R

2

Spherical plain bearings



2 Spherical plain bearings

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

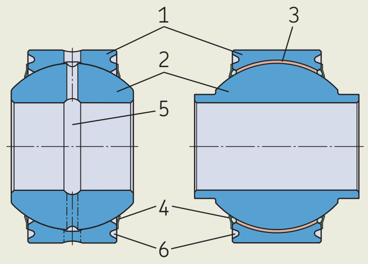
Spherical plain bearings are used widely in fixed wing and helicopter aircraft structures.

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



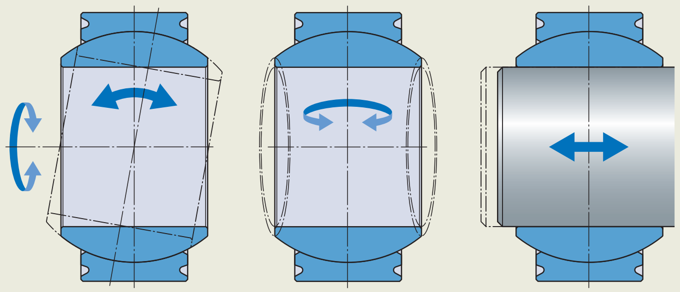
Bearing terminology

(Figure 1)

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

Figure 2

Bearing motion

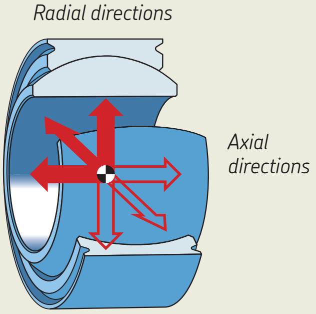


Bearing rotation and swivelling motions

Bearing axial translation 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 121**.

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 121**. 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**).

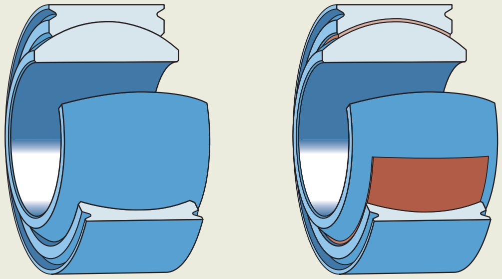
Metal-to-metal bearings are supplied greased, ready for operation. Depending on application conditions, they may require periodic relubrication. Bearing variants with lubrication holes and grooves in the inner and/or outer rings are therefore available. Refer to *Lubrication* **page 127**.

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 126**.

Figure 4

Types of spherical plain bearings



Metal-to-metal spherical plain bearing

Self-lubricating spherical plain bearing

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 138** and *Surface treatments* **page 139**.

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 140**.

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 137** and *Friction and torque* **page 136**.

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 270**.

Common design features

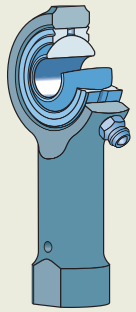
The standard assortment of SKF spherical plain bearings is comprised of a wide range of designs, dimension series and sizes. It also includes a large variety of optional features (lubrication, sealing, surface treatments, etc.) to meet specific application needs. The most important options are related 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 145**.
- 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.

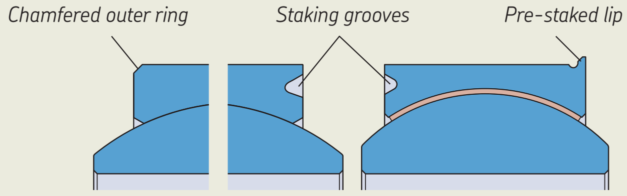
Figure 5



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 131** for metal-to-metal spherical plain bearings and **page 140** for self-lubricating spherical plain bearings

Contact your regional SKF partner via 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 122**) and *Self-lubricating bearings* (**page 132**).

Table 2

Basic selection guidelines

Characteristic	Metal-to-metal (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

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		• The first generation of metal-to-metal spherical plain bearings. • The outer ring has two slots in one side face. The slots are dimensioned larger than the inner ring. • The slots enable the inner ring to be easily mounted in the outer ring and to be easily dismounted. • The inner ring can also be integrated into a housing, such as a rod end body machined with slots. Refer to *Rod end* **page 270**. • Load carrying capability is reduced when load is applied in the direction of the slots.
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. • This design provides more sizes and variants (including high-misalignment) compared to loader slot bearings. • The baseline for most of the international standards. • 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 *Material* **page 128**.
Split inner ring		• 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. • Enables the inner ring to be easily mounted in the outer ring and to be easily dismounted. • 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 *Customized products* **page 131**.

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

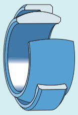
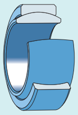
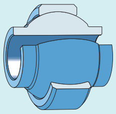
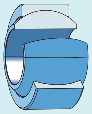
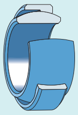
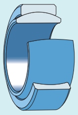
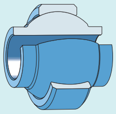
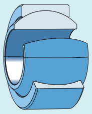
Design		Variant	Standard	SKF series	Table number	Page
Loader slot		EN	EN 2336, EN 2588	GE	2.1	146
		SKF	–	GL	2.2	150
		High load	–	GLS...RTG	2.3	154
		Wide	–	GT	2.4	156
Swaged		Light	EN 2335	MA	2.5	158
		Narrow	–	ME	2.6	162
		Wide	–	ML	2.7	166
		High misalignment	–	MT	2.8	170
Split inner ring		SKF	–	2 PL	2.9	172

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	174
Swaged		Narrow	AS 21154, AS 21155	ME	2.11	176
		Narrow	EN 6046	ENE	2.12	180
		Wide	–	ML	2.13	184
		Wide	EN 4265, EN 4266	ENL	2.14	188
		High misalignment	–	MT	2.15	192
		AS	AS 81936/1, AS 81936/2	QXMB	2.16	196
Split inner ring		SKF	–	2 PL	2.17	200

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 123** 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 124**.
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 192**. 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 124**.

6. Choose all other required options, including *Lubrication* (**page 127**), *Surface treatments* (**page 129**), *Internal clearance* (**page 126**), *Sealing* and *shielding* (**page 130**), *Dismounting* and *Oversized dimensions* (**page 145**), *Staking grooves and mounting condition* (**pages 120** and **144**).

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 131**

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

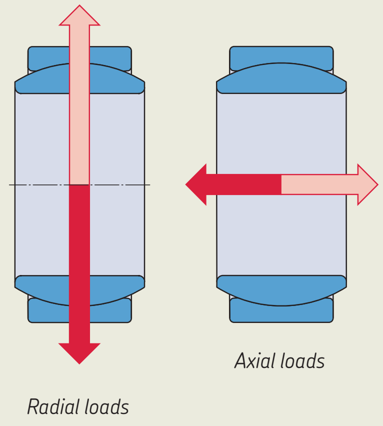
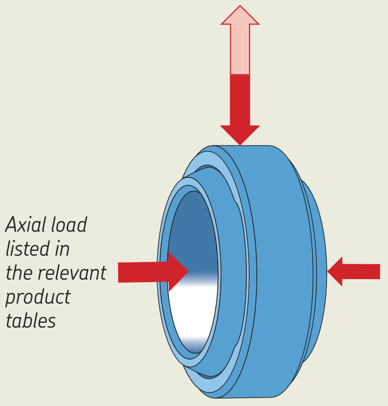


Figure 8

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 127**. 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 130**).

SKF can also provide surface treatments to extend bearing dynamic life by improving contact conditions and thus delaying wear and seizing (*Surface treatments* **page 129**).

Figure 9

Bearing motion in endurance

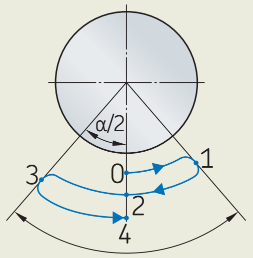
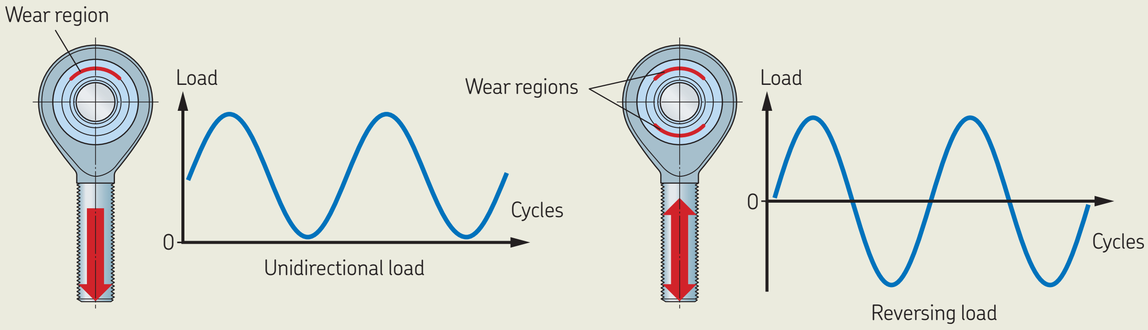


Table 7

Sliding contact surface combinations (Inner ring/outer ring)	**Typical dynamic loading condition**
Steel/steel	• Fatigue
Steel/bronze	• Fatigue • Endurance at low frequency
Bronze/steel	• Fatigue • Endurance at low frequency • Bore motion

Figure 10

Bearing loading condition and wear regions



Unidirectional load

Reversing load

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 143**
- Thermal expansion of the bearing rings and associated components

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

Figure 11

Internal clearance

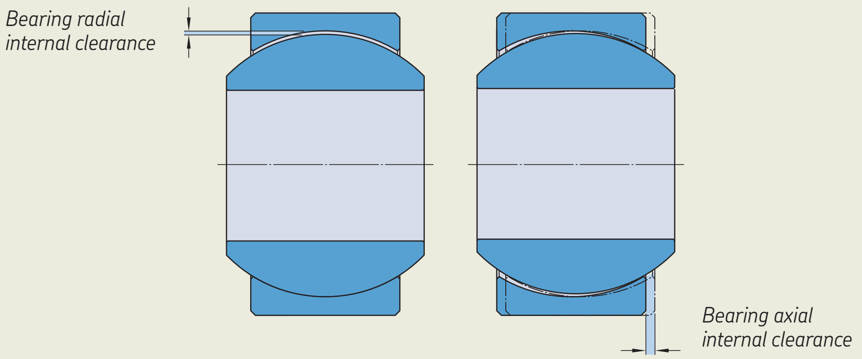


Table 8

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 *(–64 to +350 °F)*
G354 type I	MIL PRF 23827 type I	–73 to +121 °C *(–100 to +250 °F)*
G353	MIL G 21164	–73 to +121 °C *(–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 127**. For optimum bearing performance, relubrication should be performed frequently, for instance, during aircraft planned maintenance.

Refer to *Load carrying capability* **page 124** 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 126** 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

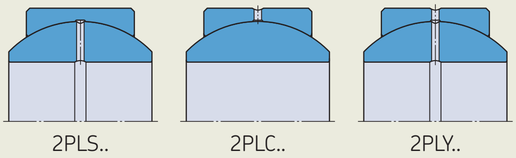


Figure 13

Relubrication via the outer ring

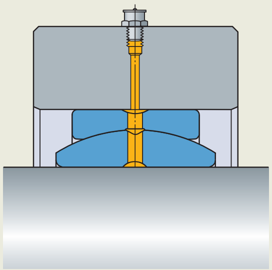
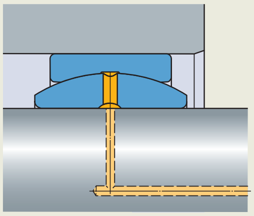


Figure 14

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 126**).

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 129**) or *Customized products* (refer to *Customized products* **page 131**).

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 125**)

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/go/aero and refer to *Customized products* **page 131**.

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 corrosion-resistant 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**.

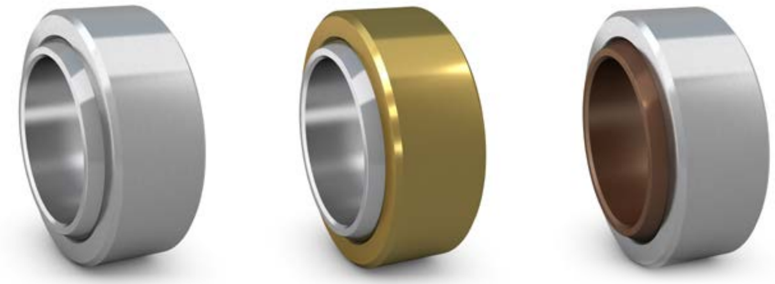
Selection is to be made according to operating conditions, refer to *Bearing selection process* **page 124**.

- 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.

Figure 15

Standard material combinations



Code W
steel/steel

Code WQ
steel/bronze

Code Q
bronze/steel

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 IR1) = 60 to 63 For OR2) = 58 to 62	52100	EN 2031	AMS 6440 or AMS 6444	100Cr6 (100C6)
Corrosion-resistant steel	Good	For IR1) = 55 to 62 For OR2) = 58 to 61	440C	EN 2030	AMS 5630 or AMS 5618	X105CrMo17 (Z100CD17)
Bronze beryllium	Very good	≥ 37	CuBe 1.9	–	AMS 4533 or AMS 4535	–

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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[1] plating on the outer ring external surfaces, typically used to enhance corrosion resistance and/or fretting resistance
- Chromium plating[1] 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
- Cadmium plating[1] according to AMS-QQ-P-416 or AMS03-19[2]
- Zinc-nickel plating according to AMS 2417
- Hard chromium plating[1] according to AMS 2460[3]

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 131**.

Dry lubricants

Dry lubricants such as MoS_2 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 131**.

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[1] Treatment includes chromium 6 compounds and may be subject to environmental legislation

[2] Formerly DEF STAN 03-19

[3] 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 For AS series ≥ 56 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 For inch EN series = 28 to 38 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:

Δdmp = Single plane mean bore diameter deviation
ΔDmp = Single plane mean outside diameter deviation

Figure 16, top figure, shows measurement definitions for a single plane mean diameter deviation.

And

Δds = Deviation of a single bore diameter
ΔDs = Deviation of a single outside diameter

Figure 16, bottom figure, shows measurement definitions for the deviation of a single diameter.

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.

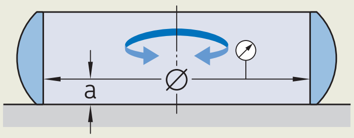
For customized sealing and shielding solutions, refer to *Customized products* **page 131.**

The geometrical, physical and mechanical characteristics of the sealed and shielded spherical plain bearings are identical to those of non protected bearings, except:

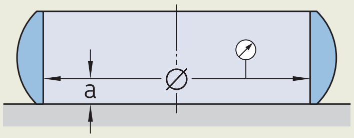
- The life under dynamic load in contaminated environments can be increased significantly
- The torque, especially for sealed bearings, can be increased
- The swivelling angle is reduced by 2 to 4° depending on the bearing type

Figure 16

Dimensional tolerances measurement principle



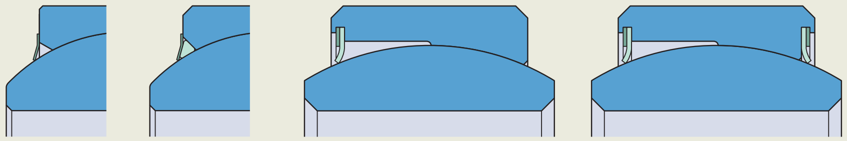
Δdmp and ΔDmp



Δds and ΔDs

Figure 17

Standard sealing and shielding solutions



Shielding code PP *Sealing code TT* *Sealing code E* *Sealing code EE*

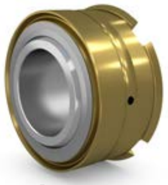
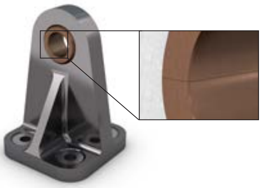
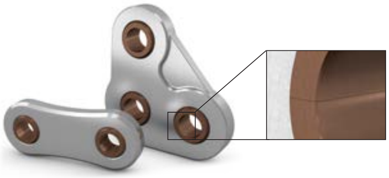
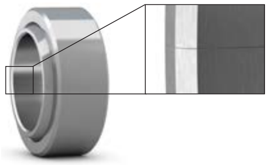
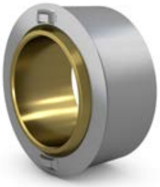
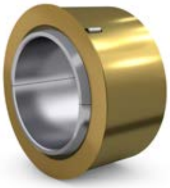
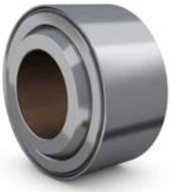
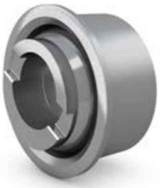
Customized products

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

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 135**.

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 143**. 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 138**.

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 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.
   - 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 134**.
6. Choose all other required options, including Surface treatments (**page 139**), *Friction and torque* (**page 136**), *Internal clearance* (**page 137**), *Sealing and shielding* (**page 139**), *Dismounting* and *Oversized dimensions* (**page 145**), *Staking groove and mounting condition* (**pages 120** and **144**).

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 140**.

Table 12

Self-lubricating spherical plain bearings, metric dimensions

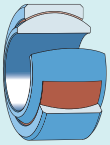
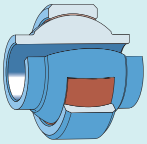
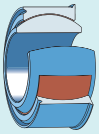
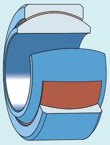
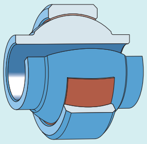
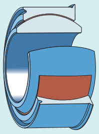
Figure	Variant	Standard	SKF series	Table number	Page
	Light	EN 3048, EN 4037	LEN..	2.18	204
	Narrow	EN 2584, EN 4038	NEN..	2.19	206
	Wide	EN 2585, EN 4039	WEN..	2.20	210
	High misalignment	EN 4040	HMEN..	2.21	214
	High misalignment	SKF	XRT..	2.22	216
	Pre-staked	SKF	XRL..FR	2.23	218

Table 13

Self-lubricating spherical plain bearings, inch dimensions

Figure	Variant	Standard	SKF series	Table number	Page
	Narrow controlled clearance	SKF	SN..ZT	2.24	220
	Narrow	NSA 8134, NSA 8136	SN..	2.25	222
	Narrow	AS 14101, AS 14104	NAS..	2.26	226
	Narrow	AS 81820/1, AS 81820/4	NAS..A..	2.27	230
	Wide	NSA 8135, NSA 8137	SW..	2.28	234
	Wide	AS 14102, AS 14103	WAS..	2.29	238
	Wide	AS 81820/2, AS 81820/3	WAS..A..	2.30	244
	High misalignment	SKF	SH..	2.31	246
	High misalignment	SKF	11..H..	2.32	248
	High misalignment	SKF	XRT..	2.33	250
	Pre-staked	SKF	XRL..FR	2.34	254

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:

$$C_s = \frac{2}{3}\,\sigma_{yield}\,A_r$$

Where:
C_s = Radial static limit load [kN/*lbf*]
σ_{yield} = Outer ring yield stress [MPa/*psi*]
A_r = Radial projected area [mm^2/in^2] **(table 14)**

Static axial limit load

The approximate axial static limit load, C_a can be calculated using:

$$C_a = \frac{1}{3}\,\sigma_{yield}\,A_a$$

Where:
C_a = Axial static limit load [kN/*lbf*]
σ_{yield} = Outer ring yield stress [MPa/*psi*]
A_a = Axial projected area [mm^2/in^2]
(**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

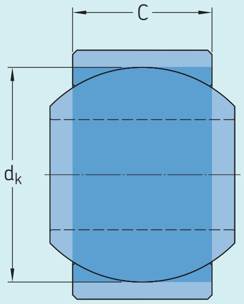
The dynamic load carrying capability listed in the relevant product tables corresponds to standard operational cases as defined in the aeronautical standards AS 81820 and EN 2755 with the following parameters:

- Unidirectional radial load
- Room temperature
- Rotation: ±25° (100° total per cycle). See **figure 18**. With $\alpha = 25°$
- Duration: 25 000 cycles
- Speed: 10 cycles per minute

Table 14

Projected area
Direction

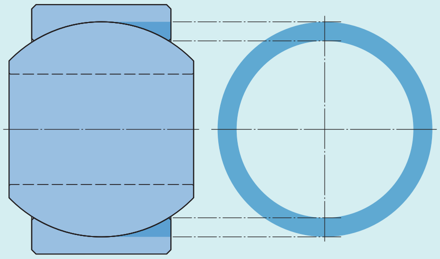
Radial



$$A_r = d_k(C-1{,}6)$$

Where:
A_r = Radial area [mm^2]
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^2]
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 135** and *Surface coating* **page 138** 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 138**.

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 137**.
- 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 (α)

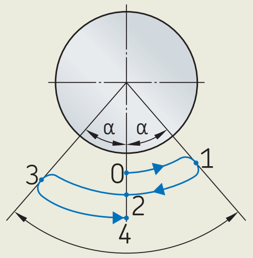


Figure 19

Bearing wear rate

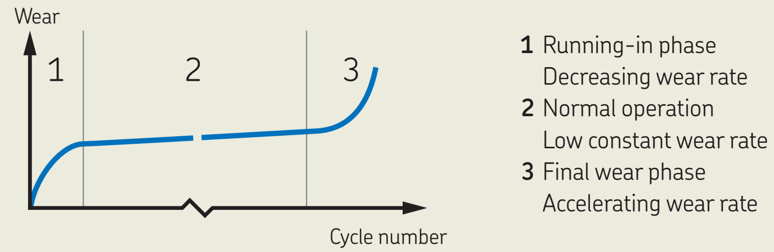
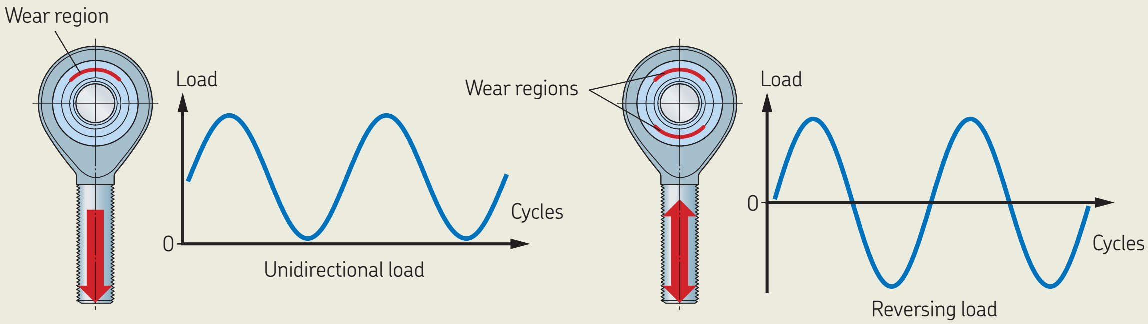


Figure 20

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 137**).

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 136**.

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 139**.

The mounting conditions can influence the bearing unloaded torque. Refer to *Mounting* **page 143**.

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 140**.

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
μ = 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.

Diagram 1

Bearing friction coefficient

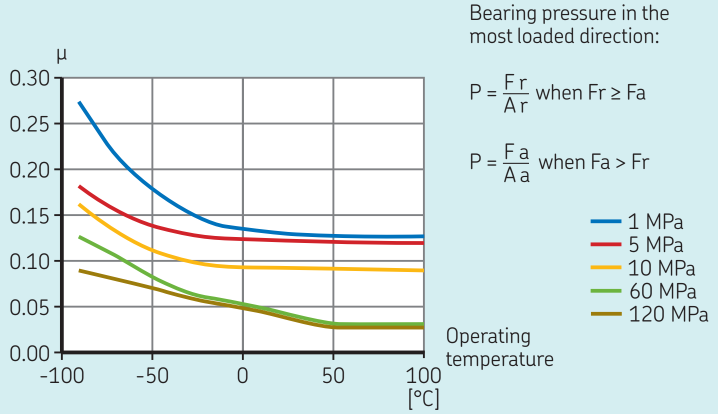
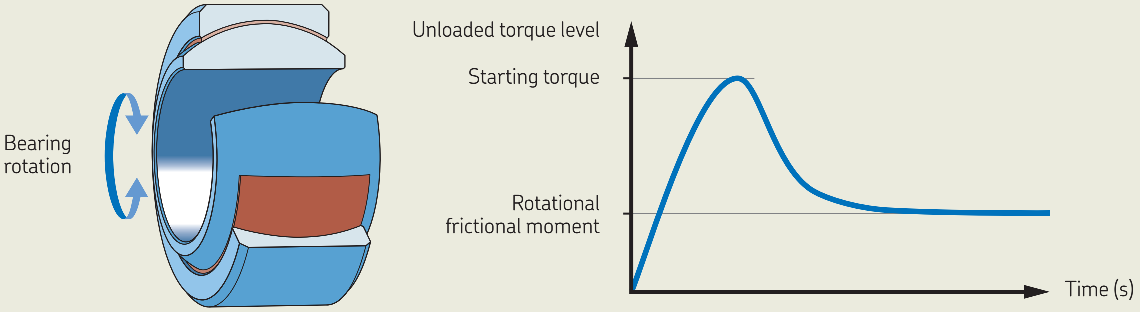


Figure 21

Bearing rotational torque



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 143**.

Operating temperature

Installation

For the purpose of installation by temperature difference, self-lubricating spherical plain bearings can be immersed in liquid nitrogen at –193 °C (*–315 °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 °C (*–67 to +325 °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 °C (*–315 to +482 °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 135**. 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

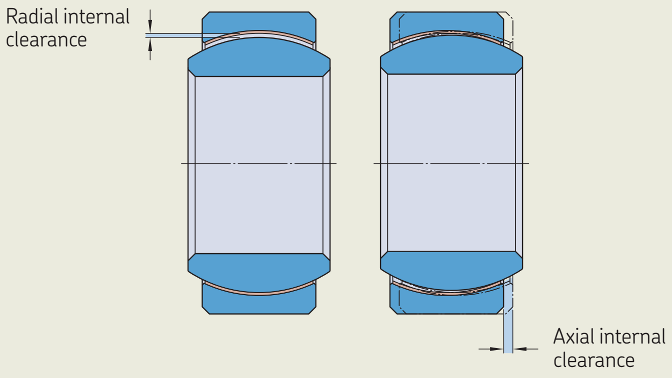
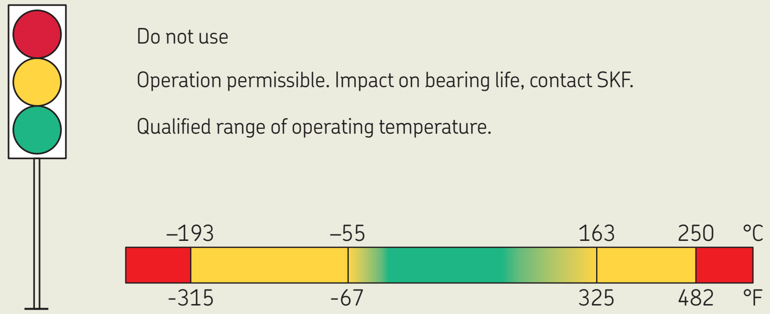


Figure 23

Bearing operating temperature range



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 140**.

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 140** 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[1] 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
- Cadmium plating[1] according to AMS-QQ-P-416 or AMS03-19[2]
- Zinc-nickel plating according to AMS 2417
- Hard chromium plating[1] according to AMS 2460[3]

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

For specific surface treatments, please refer to *Customized products* **page 140**.

Dimensions and tolerances

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

Δdmp = Single plane mean bore diameter deviation

ΔDmp = Single plane mean outside diameter deviation

Figure 25, top figure, shows a typical measurement method for a single plane mean diameter deviation.

And

Δds = Deviation of a single bore diameter

ΔDs = Deviation of a single outside diameter

Figure 25, bottom figure, shows a typical measurement method for the deviation of a single diameter.

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.

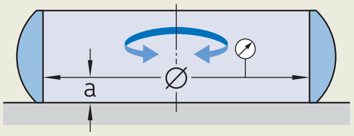
The shields are fixed on the outer ring and are in close contact with the inner ring spherical surface. For sealed versions, seals are pressed between shields and the inner ring spherical surface (**figure 26**).

The geometrical, physical and mechanical characteristics of the sealed and shielded spherical plain bearings are identical to those of the unprotected bearings, except:

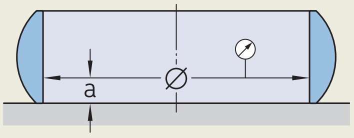
- The life under dynamic load in contaminated environments can be increased significantly
- The torque, especially for sealed bearings, can be increased
- The swivelling angle is reduced by 2 to 4° depending on the bearing type

Figure 25

Dimensional tolerances measurement principle



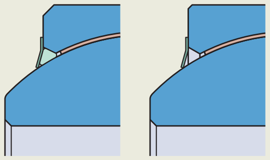
Δdmp and ΔDmp



Δds and ΔDs

Figure 26

Bearing sealing and shielding solutions



Sealed bearing type "TT" *Shielded bearing type "PP"*

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[1] Treatment includes chromium 6 compounds and may be subject to environmental legislation

[2] Formerly DEF STAN 03-19

[3] 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.

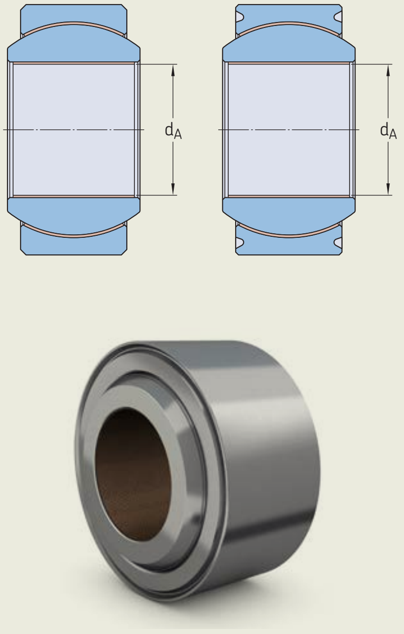
The standard liner is the same as the one used on the spherical surface. For more information, refer to *Liner material* **page 138**.

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*.

Figure 27

Lined bore bearing



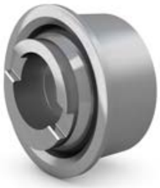
Customized products

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*	

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** Lons-le-saunier (Formerly known as SARMA)	**SKF Aerospace U.K. Limited designation system** Clevedon (Formerly known as AMPEP)
Light metric	**LEN..**	XRA..	11C..N.. (not plated) 11F..N.. (chromium plated sphere)
Narrow metric	**NEN..**	XRE..	11C..W.. (Not plated) or 11F..W.. (chromium plated sphere) for bore code 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)
Wide metric	**WEN..**	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 code ≥ 6
High misalignment metric	**HMEN..**	RL..SP.. (stepped design inner ring)	11E..H (Blended design inner ring)
Narrow inch	**NAS..**	XRE..	11HN.. (Inner ring sphere surface coated) 11BN..
Narrow inch lined bore	**NAS..A..**	XRE..A..	11LHN.. (Inner ring sphere surface coated) 11LBN..
Wide inch	**WAS..**	XRL..	11HW.. (Inner ring sphere surface coated) 11BW..
Wide inch lined bore	**WAS..A..**	XRL..A..	11LHW.. (Inner ring sphere surface coated) 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 16**

The fit selection can affect the selection of the clearance or torque variant (**table 16**).

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 136** and *Internal clearance* **page 137** 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 16

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 –0,002 to –0,012 mm *–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 +0,025 to +0,010 mm *+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 +0,100 to +0,050 mm *+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 +0,020 to –0,005 mm *+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 142**. 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 128** and **137**).

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

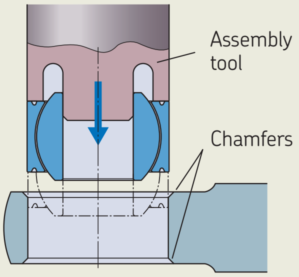


Figure 29

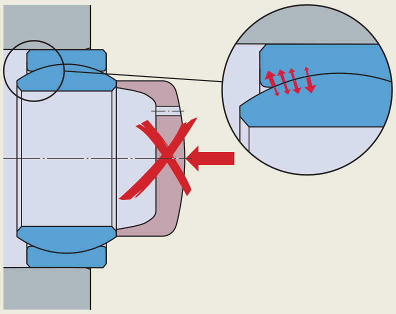


Figure 30

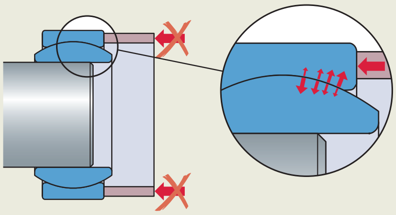


Figure 31

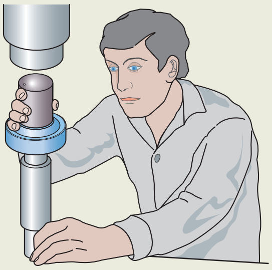
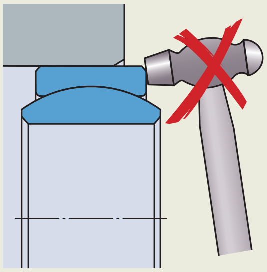


Figure 32



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.

Anvil staking Process

1. Install bearing as detailed in *Mounting* **page 143**. 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 144**.
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 144** 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

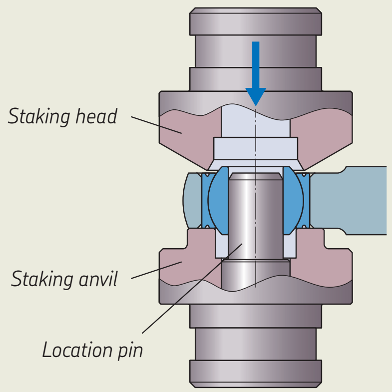


Figure 34

Tooling arrangement final stage stake

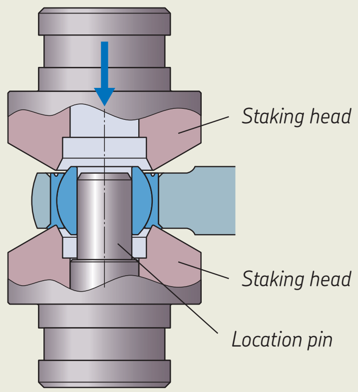
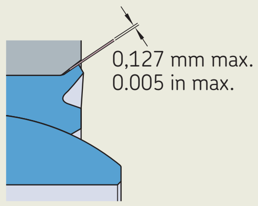


Figure 35

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 131** and **140**.

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 17**):

- 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.

Figure 36

Threaded or bolted retention plate

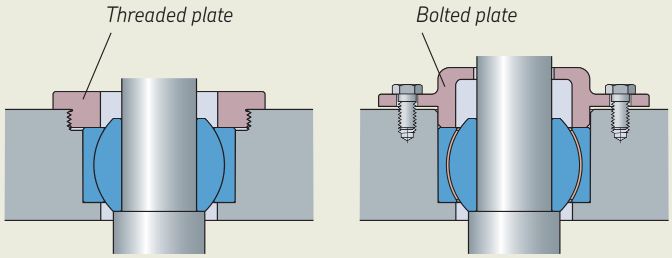


Table 17

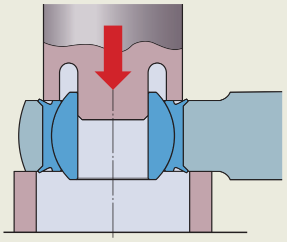
Bearing storage conditions

Standard	Metal-to-metal bearings	Self-lubricating bearings
Storage life	5 years	15 years[1]
Storage temperature	15 to 35 °C *(55 to 95 °F)*	15 to 25 °C *(55 to 77 °F)*
Relative humidity	50 to 70%	50 to 70%

[1] 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.

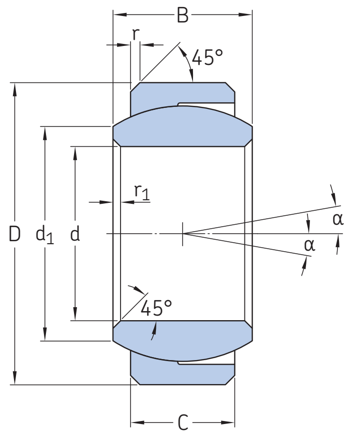
Figure 37

Bearing dismounting

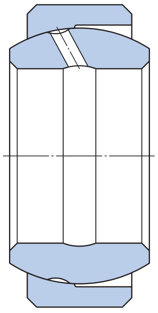


2.1 Metal-to-metal loader slot (metric dimensions)

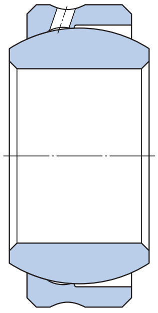
GE.. bore code **4** to **20**



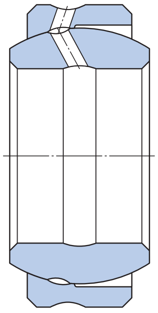
GE..



GES..



GEC..



GEY..

Technical specification	EN 2337
Product standards	EN 2336 (Bearing steel) EN 2588 (Corrosion-resistant steel)
Surface treatment	One of the spherical surfaces is treated with molybdenum disulfide

Dimensions

Nominal bore code	Dimensions d	Δdmp	Δds	D	ΔDmp	ΔDs	C 0/–0,25	B 0/–0,06
–	mm	µm		mm	µm		mm	
4[1]	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_1 ≈	r	r_1	α	Mass ≈	Static limit loads[2] Radial C_s	Axial C_a	Axial clearance Standard	Reduced	Radial clearance max Standard	Reduced
–	mm			°	g	kN		µm			
4[1]	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

---

[1] SKF option

[2] Loads are given in the opposite direction to the slots

Designation system

Examples: ZWGE20DS-C2A-2CP6R10
QGE30CEE

Z	W	GE	20	D	S	–C2A	E	-2	CP6	R10

Surface treatment of outer ring

No code	Not plated
Z[1]	Cadmium plated external dimensions
SZ[1]	Zinc-nickel plated external dimensions

Material

No code	Bearing steel inner ring and outer ring
W	Corrosion-resistant steel inner ring and outer ring
Q[1]	Bronze beryllium inner ring and corrosion-resistant steel outer ring

Basic designation

Bore code

Lubrication grooves

No code	Without lubrication groove
S	Lubrication by inner ring
C[3]	Lubrication by outer ring
Y[1]	Lubrication by inner and outer ring

Clearance code	Axial clearance	Radial clearance
D..C2A	Standard	Standard
No code[1]	Reduced	No requirement
D[1]	Standard	No requirement
D..C1A[1]	No requirement	Reduced
..C3A	Reduced	Reduced

Seal

No code	No seal
E[4]	Sealed on the slot side
EE[4]	Sealed on both sides

Lubricant

No code	Grease G354
–2	Grease G395

Surface treatment of inner ring sphere

No code	Not plated
CP6[1]	Chromium plated sphere
CP109[1]	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55[2]	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
R10	0,01 mm oversized outer diameter
R20	0,02 mm oversized outer diameter

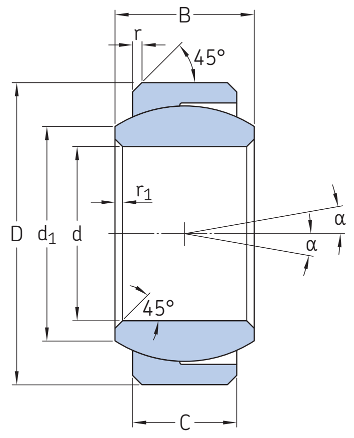
---

[1] SKF option
[2] Available only for inner ring in corrosion-resistant steel inner ring
[3] No groove in the outer ring sphere for d ≤ 6
[4] Only available for d ≥ 6

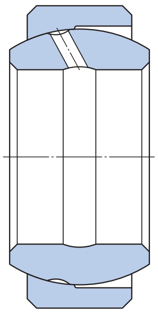
2.1 Metal-to-metal loader slot (metric dimensions)

GE.. bore code **25** to **80**

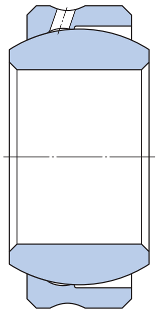
Technical specification	EN 2337
Product standards	EN 2336 (Bearing steel) EN 2588 (Corrosion-resistant steel)
Surface treatment	One of the spherical surfaces is treated with molybdenum disulfide



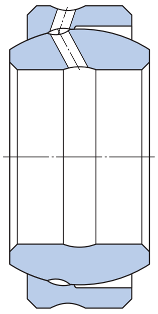
GE..



GES..



GEC..



GEY..

Dimensions

Nominal bore code	Dimensions d	Δdmp	Δds	D	ΔDmp	ΔDs	C 0/–0,25	B 0/–0,06
–	mm	µm		mm	µm		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	α	Mass ≈	Static limit loads[1) Radial Cs	Axial Ca	Axial clearance Standard	Reduced	Radial clearance max Standard	Reduced
–	mm			°	g	kN		µm			
25	29,3	0,9/1,3	0,7/1,1	7	115	270	18	30/60	1/30	15	8
30	34,2	0,9/1,3	0,7/1,1	6	160	393	25	30/60	1/30	15	8
35	39,8	0,9/1,3	0,7/1,1	7	229	508	31	40/80	1/40	20	10
40	45	1,4/1,8	1,2/1,7	7	315	637	38	40/80	1/40	20	10
45	50,8	1,4/1,8	1,2/1,7	7	460	825	50	40/80	1/40	20	10
50	55,9	1,4/1,8	1,2/1,7	7	560	1 017	64	40/80	1/40	20	10
60	66,8	1,4/1,8	1,2/1,7	6	1 100	1 584	104	50/100	1/50	25	15
70	77,8	1,4/1,8	1,2/1,7	6	1 540	2 013	128	50/100	1/50	25	15
80	89,4	1,4/1,8	1,2/1,7	6	2 290	2 640	163	50/100	1/50	25	15

---

1) Loads are given in the opposite direction to the slots

Designation system

Examples: ZWGE20DS-C2A-2CP6R10
QGE30CEE

Z W GE 20 D S –C2A E -2 CP6 R10

Surface treatment of outer ring

No code	Not plated
Z1)	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Material

No code	Bearing steel inner ring and outer ring
W	Corrosion-resistant steel inner ring and outer ring
Q1)	Bronze beryllium inner ring and corrosion-resistant steel outer ring

Basic designation

Bore code

Lubrication grooves

No code	Without lubrication groove
S	Lubrication by inner ring
C3)	Lubrication by outer ring
Y1)	Lubrication by inner and outer ring

Clearance code	**Axial clearance**	**Radial clearance**
D..C2A	Standard	Standard
No code1)	Reduced	No requirement
D1)	Standard	No requirement
D..C1A1)	No requirement	Reduced
..C3A	Reduced	Reduced

Seal

No code	No seal
E4)	Sealed on the slot side
EE4)	Sealed on both sides

Lubricant

No code	Grease G354
–2	Grease G395

Surface treatment of inner ring sphere

No code	Not plated
CP61)	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP552)	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
R10	0,01 mm oversized outer diameter
R20	0,02 mm oversized outer diameter

---

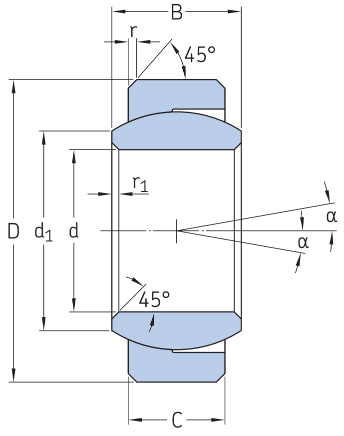
1) SKF option
2) Available only for inner ring in corrosion-resistant steel inner ring
3) No groove in the outer ring sphere for d ≤ 6
4) Only available for d ≥ 6

2.2 Metal-to-metal loader slot normal (metric dimensions)

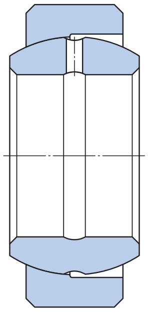
GL.., GLD.., GLS.. and GLS..TAG bore code **4** to **17/30**

Technical specification –

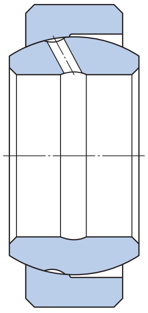
Product standards –



GL../GLD..



GLS..



GLS...TAG

Dimensions

Nominal bore code	Dimensions d	Δdmp GL.., GLD.. and GLS..	GLS..TAG only	D	ΔDmp GL.., GLD.. and GLS..	GLS..TAG only	C h11	B h11
–	mm	µm		mm	µm		mm	
4	4	0/–8	–	12	0/–8	–	3	5
5	5	0/–8	–	14	0/–8	–	4	6
6	6	0/–8	–	14	0/–8	–	4	6
8/16	8	0/–8	–	16	0/–8	–	5	8
8	8	0/–8	–	17	0/–8	–	5	8
10/19	10	0/–8	–	19	0/–9	–	6	9
10	10	0/–8	–	20	0/–9	–	6	9
12	12	0/–8	+11/0	22	0/–9	0/–9	7	10
14	14	0/–8	+11/0	25	0/–9	0/–9	8	11
15/26	15	0/–8	+11/0	26	0/–9	0/–9	9	12
15	15	0/–8	+11/0	28	0/–9	0/–9	9	12
16	16	0/–8	+11/0	28	0/–9	0/–9	9	12
17	17	0/–8	+11/0	32	0/–11	0/–11	10	14
17/30	17	0/–8	+11/0	30	0/–11	0/–11	10	14

Dimensions cont., loads and clearance

Nominal bore code	Dimensions d_1 ≈	r GL.., GLD.. and GLS..	r_1	r GLS..TAG only +0,3/0	r_1 +0,3/0	α	Mass ≈	Static limit loads[1] Radial C_s	Axial C_a	Axial clearance GL..	GLD.. and GLS..	GLS..TAG
–	mm					°	g	kN		µm		
4	6,2	0,4/0,8	0,4/0,7	–	–	16	3	7,7	0,45	0/30	30/60	–
5	8	0,4/0,8	0,4/0,7	–	–	13	4	14	0,8	0/30	30/60	–
6	8	0,4/0,8	0,4/0,7	–	–	13	4	17,5	1	0/30	30/60	–
8/16	10,2	0,4/0,8	0,4/0,7	–	–	15	8	27	1,8	0/30	30/60	–
8	10,2	0,4/0,8	0,4/0,7	–	–	15	10	27	1,8	0/30	30/60	–
10/19	13,2	0,4/0,8	0,5/0,8	–	–	12	12	44	2,5	0/30	30/60	–
10	13,2	0,4/0,8	0,5/0,8	–	–	12	13	44	2,5	0/30	30/60	–
12	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
14	16,7	0,7/1,2	0,5/0,8	0,7	0,5	10	22	60	4	0/30	30/60	5/15
15/26	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
15	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
16	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
17	20,7	0,9/1,3	0,7/1,1	1	0,5	10	52	112	6,7	0/30	30/60	5/15
17/30	20,7	0,9/1,3	0,7/1,1	1	0,5	10	54	112	6,7	0/30	30/60	5/15

---

[1] Loads are given in the opposite direction to the slots

Designation system

Examples: ZWGLS20TAGE-2CP6R10
QGLD15/26EE

Z W GL S 20 TAG E –2 CP6 R10

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Material

No code	Bearing steel inner ring and outer ring
W	Corrosion-resistant steel inner ring and outer ring
Q	Bronze beryllium inner ring and corrosion-resistant steel outer ring

Basic designation

Lubrication grooves and axial clearance

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[1]	Lubrication by inner ring (inclined groove) and reduced axial clearance

Bore code

Seal

No code	No seal
E[3]	Sealed on the slot side
EE[3]	Sealed on both sides

Lubricant

No code	Grease G354
–2	Grease G395

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[2]	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
R10	0,01 mm oversized outer diameter
R20	0,02 mm oversized outer diameter

---

[1] Only available for bore code ≥ 12 and ≤ 50

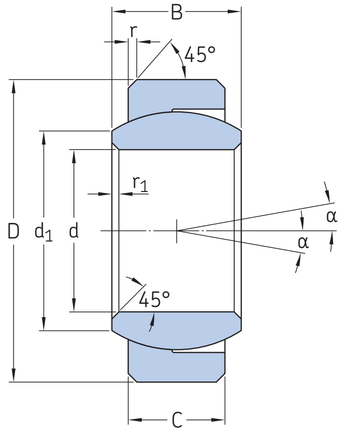
[2] Available only for inner ring in corrosion-resistant steel material

[3] Only available for d ≥ 6

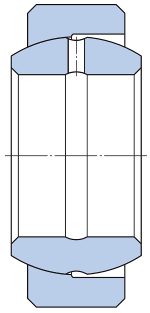
2.2 Metal-to-metal loader slot normal (metric dimensions)

GL.., GLD.., GLS.. and GLS..TAG bore code **20** to **80**

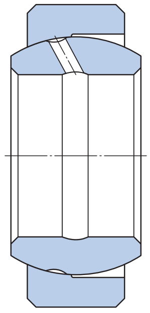
Technical specification	–
Product standards	–



GL../GLD..



GLS..



GLS...TAG

Dimensions

Nominal bore code	Dimensions d	Δdmp GL.., GLD.. and GLS..	GLS..TAG only	D	ΔDmp GL.., GLD.. and GLS..	GLS..TAG only	C h11	B h11
–	mm	µm		mm	µm		mm	
20	20	0/–10	+13/0	35	0/–11	0/–11	12	16
25	25	0/–10	+13/0	42	0/–11	0/–11	16	20
30/47	30	0/–10	+13/0	47	0/–11	0/–11	18	22
35	35	0/–12	+16/0	55	0/–13	0/–13	20	25
40	40	0/–12	+16/0	62	0/–13	0/–13	22	28
45/68	45	0/–12	+16/0	68	0/–13	0/–13	25	32
50	50	0/–12	+16/0	75	0/–13	0/–13	28	35
55	55	0/–15	–	85	0/–15	–	32	40
60	60	0/–15	–	90	0/–15	–	36	44
70	70	0/–15	–	105	0/–15	–	40	49
80	80	0/–15	–	120	0/–15	–	45	55

Dimensions cont., loads and clearance

Nominal bore code	Dimensions d_1 ≈	r GL.., GLD.. and GLS..	r_1	r GLS..TAG only +0,3/0	r_1 +0,3/0	α	Mass ≈	Static limit loads[1)] Radial C_s	Axial C_a	Axial clearance GL..	GLD.. and GLS..	GLS..TAG
–	mm					°	g	kN		µm		
20	24,1	0,9/1,3	0,7/1,1	1	0,5	9	65	162	9,8	0/30	30/60	10/20
25	29,3	0,9/1,3	0,7/1,1	1	0,5	7	115	270	18	0/30	30/60	10/20
30/47	34,2	0,9/1,3	0,7/1,1	1	0,5	6	160	393	25	0/30	30/60	10/20
35	39,8	0,9/1,3	0,7/1,1	1	0,5	7	229	508	31	0/40	40/80	10/20
40	45	1,2/1,7	1,2/1,7	1,5	0,5	7	315	637	38	0/40	40/80	10/20
45/68	50,8	1,2/1,7	1,2/1,7	1,5	0,5	7	460	825	50	0/40	40/80	10/20
50	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
55	62,2	1,2/1,7	1,2/1,7	–	–	7	805	1 297	82	0/50	50/100	–
60	66,8	1,2/1,7	1,2/1,7	–	–	6	1 100	1 584	104	0/50	50/100	–
70	77,8	1,2/1,7	1,2/1,7	–	–	6	1 540	2 013	128	0/50	50/100	–
80	89,4	1,2/1,7	1,2/1,7	–	–	6	2 200	2 640	163	0/50	50/100	–

[1)] Loads are given in the opposite direction to the slots

Designation system

Examples: ZWGLS20TAGE-2CP6R10
QGLD15/26EE

Z W GL S 20 TAG E –2 CP6 R10

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Material

No code	Bearing steel inner ring and outer ring
W	Corrosion-resistant steel inner ring and outer ring
Q	Bronze beryllium inner ring and corrosion-resistant steel outer ring

Basic designation

Lubrication grooves and axial clearance

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[1]	Lubrication by inner ring (inclined groove) and reduced axial clearance

Bore code

Seal

No code	No seal
E[3]	Sealed on the slot side
EE[3]	Sealed on both sides

Lubricant

No code	Grease G354
–2	Grease G395

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[2]	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
R10	0,01 mm oversized outer diameter
R20	0,02 mm oversized outer diameter

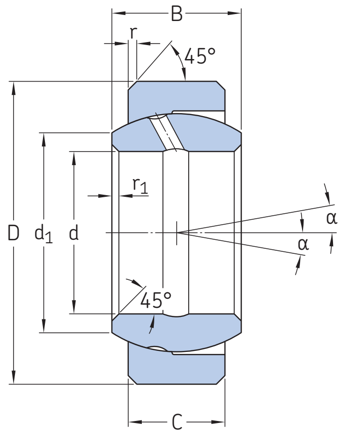
---

[1] Only available for bore code ≥ 12 and ≤ 50
[2] Available only for inner ring in corrosion-resistant steel material
[3] Only available for d ≥ 6

2.3 Metal-to-metal loader slot normal reinforced (metric dimensions)

GLS..RTG

Technical specification	–
Product standards	–



GLS..RTG

Dimensions

Nominal bore code	Dimensions d	Δdmp H6	D	ΔDmp h5	C h11	B 0/–0,05
–	mm	µm	mm	µm	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 d_1 ≈	r +0,3/0	r_1 +0,3/0	α	Mass ≈	Static limit loads1) Radial C_s	Axial C_a	Axial clearance
–	mm			°	g	kN		µm
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

---

1) Loads are given in the opposite direction to the slots

Designation system

Examples: ZWGLS20MRTGE-2CP6R10
QGLS12RTGEE

Z W GLS 20 M RTG E -2 CP6 R10

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Material

No code	Bearing steel inner ring and outer ring
W	Corrosion-resistant steel inner ring and outer ring
Q	Bronze beryllium inner ring and corrosion-resistant steel outer ring

Basic designation

Bore code

Dry-lubricant

No code	No treatment
M	With molybdenum disulfide

Seal

No code	No seal
E	Sealed on the slot side
EE	Sealed on both sides

Lubricant

No code	Grease G354
–2	Grease G395

Surface treatment of inner ring sphere

No code	Not plated
CP6	Chromium plated sphere
CP109	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55[1]	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
R10	0,01 mm oversized outer diameter
R20	0,02 mm oversized outer diameter

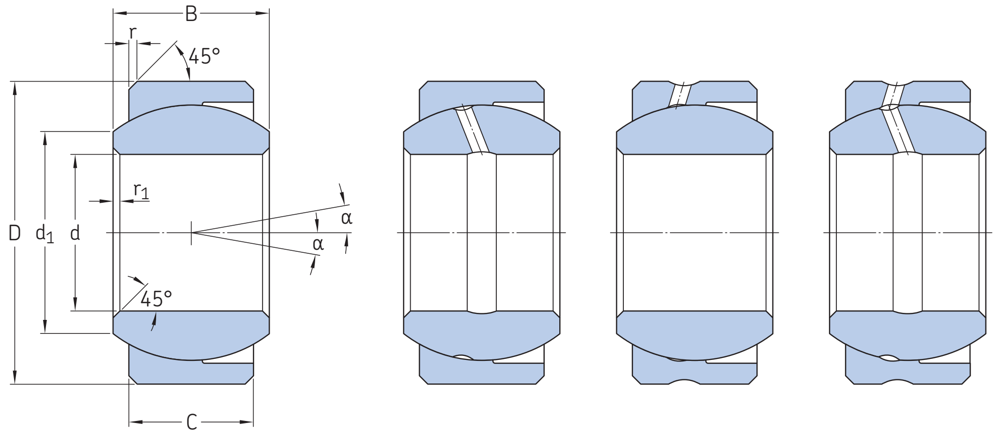
---

[1] Available only for inner ring in corrosion-resistant steel material

2.4 Metal-to-metal loader slot wide (metric dimensions)

GT

Technical specification	–
Product standards	–



GT.. GTS.. GTC.. GTY..

Dimensions

Nominal bore code	Dimensions d	Δdmp	D	ΔDmp	C ±1	B 0/–0,06
–	mm	µm	mm	µm	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				Mass	Static limit loads1)		Axial clearance	
	d_1 ≈	r +0,3/0	r_1 +0,3/0	α	≈	Radial C_s	Axial C_a	GT	GTS GTC GTY
–	mm			°	g	kN		µm	
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

---

1) Loads are given in the opposite direction to the slots

Designation system

Examples:	ZWGTS20E-2CP6R10 QGTC30EE	Z	W	GT	S	20	E	-2	CP6	R10

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Material

No code	Bearing steel inner ring and outer ring
W	Corrosion-resistant steel inner ring and outer ring
Q	Bronze beryllium inner ring and corrosion-resistant steel outer ring

Basic designation

Lubrication grooves and axial clearance

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

Bore code

Seal

No code	No seal
E	Sealed on the slot side
EE	Sealed on both sides

Lubricant

No code	Grease G354
–2	Grease G395

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[1]	Passivated corrosion-resistant steel inner ring

Oversize

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

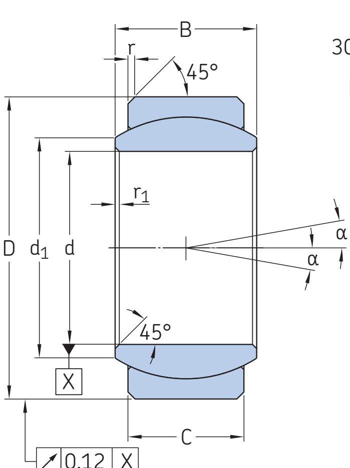
---

[1] Available only for inner ring in corrosion-resistant steel material

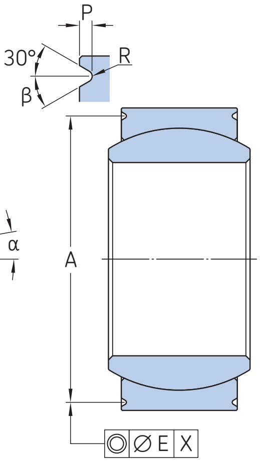
2.5 Metal-to-metal swaged light (metric dimensions)

MA bore code **4** to **20**

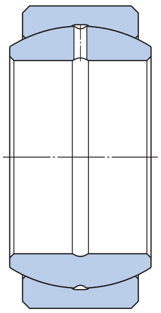
Technical specification	EN 2337
Product standards	EN 2335
Surface treatment	One of the spherical surfaces is treated with molybdenum disulfide



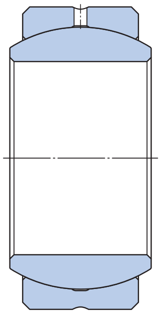
MA..



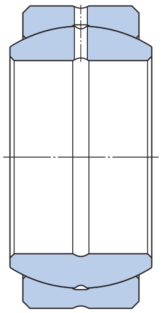
MA..R



MAS..



MAC..



MAY..

β	E
°	mm
30	0,12

Dimensions

Nominal bore code	Dimensions d	Δdmp	Δds	D	ΔDmp	ΔDs	C ±0.1	B 0/–0,06	d_1 ≈	A +0,1/0 Code R	Code PR
–	mm	µm		mm	µm		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 bore code	Dimensions P 0/-0,2 Code R	Code PR	R +0,1/0	r	r_1	α	Mass ≈	Static limit loads Radial C_s	Axial C_a2)	Axial clearance Reduced	Standard	Radial clearance Max Reduced	Standard
–	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

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[2] These values can be limited by the unstaking load (contact SKF for more information)

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
Z1)	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Material code	**Inner ring material**	**Outer ring material**
W	Corrosion-resistant steel	Corrosion-resistant steel
Q1)	Bronze beryllium	Corrosion-resistant steel
WQ1)	Corrosion-resistant steel	Bronze aluminium

Basic designation

Lubrication grooves

No code	Without lubrication groove
S3)	Lubrication by inner ring
C3) 6)	Lubrication by outer ring
Y3)	Lubrication by inner and outer ring

Bore code

Chamfer and groove

No code	Chamfered outer ring
R or PR2)	Grooved outer ring

Axial clearance

No code	Standard axial clearance
X	Reduced axial clearance

Shield and seal

No code	No shield and seal
TT1) 7)	Sealed
PP1) 7)	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP61)	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP554)	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

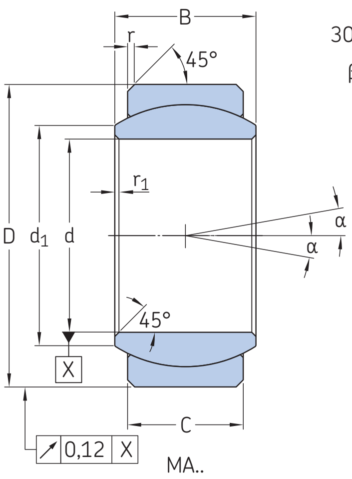
---

1) SKF option
2) SKF option for bore code ≥ 8 and ≤ 10
3) SKF option for bore code ≤ 12
4) Available only for inner ring in corrosion-resistant steel material
5) SKF option, available only for inner ring in corrosion-resistant steel material
6) No groove in the outer ring sphere for d ≤ 6
7) Only available for d ≥ 6

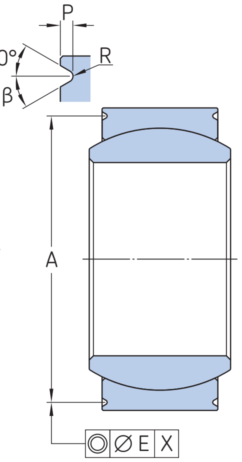
2.5 Metal-to-metal swaged light (metric dimensions)

MA bore code **25** to **70**

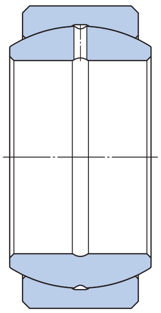
Technical specification	EN 2337
Product standards	EN 2335
Surface treatment	One of the spherical surfaces is treated with molybdenum disulfide



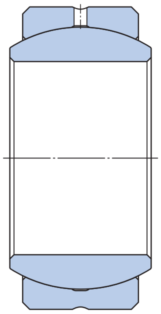
MA..



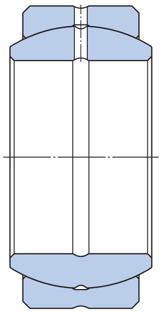
MA..R



MAS..



MAC..



MAY..

β	E
°	mm
30	0,12

Dimensions

Nominal bore code	Dimensions d	Δdmp	Δds	D	ΔDmp	ΔDs	C ±0,1	B 0/−0,06	d_1 ≈	A +0,1/0 Code R	Code PR
–	mm	µm		mm	µm		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[1]	70	0/–15	+4/–19	105	0/–15	+13/–28	40	49	77,8	101,8	–

Dimensions cont., loads and clearance

Nominal bore code	Dimensions P 0/-0,2 Code R	Code PR	R +0,1/0	r	r_1	α	Mass ≈	Static limit loads Radial C_s	Axial C_a[2]	Axial clearance Reduced	Standard	Radial clearance Max Reduced	Standard
–	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	1 100	1 056	104	5/60	60/120	20	35
70[1]	1,4	–	0,3	1,4/1,8	1,2/1,7	6	1 540	1 361,6	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)

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[1]	Cadmium plated external dimensions
SZ[1]	Zinc-nickel plated external dimensions

Material code	**Inner ring material**	**Outer ring material**
W	Corrosion-resistant steel	Corrosion-resistant steel
Q[1]	Bronze beryllium	Corrosion-resistant steel
WQ[1]	Corrosion-resistant steel	Bronze aluminium

Basic designation

Lubrication grooves

No code	Without lubrication groove
S[3]	Lubrication by inner ring
C[3] [6]	Lubrication by outer ring
Y[3]	Lubrication by inner and outer ring

Bore code

Chamfer and groove

No code	Chamfered outer ring
R or PR[2]	Grooved outer ring

Axial clearance

No code	Standard axial clearance
X	Reduced axial clearance

Shield and seal

No code	No shield and seal
TT[1] [7]	Sealed
PP[1] [7]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP6[1]	Chromium plated sphere
CP109[1]	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55[4]	Passivated corrosion-resistant steel inner ring

Oversize

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

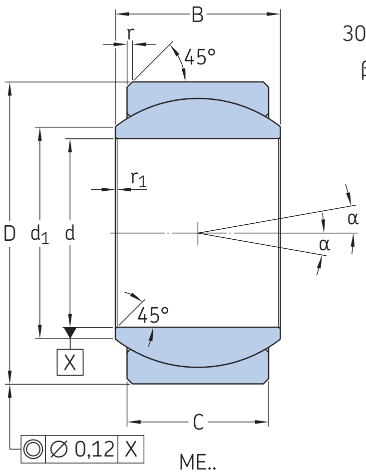
---

[1] SKF option
[2] SKF option for bore code ≥ 8 and ≤ 10
[3] SKF option for bore code ≤ 12
[4] Available only for inner ring in corrosion-resistant steel material
[5] SKF option, available only for inner ring in corrosion-resistant steel material
[6] No groove in the outer ring sphere for d ≤ 6
[7] Only available for d ≥ 6

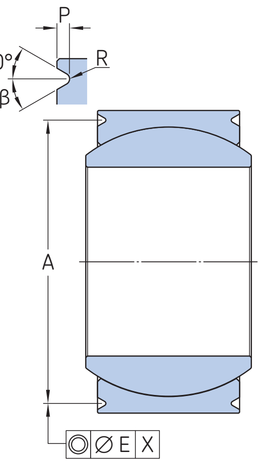
2.6 Metal-to-metal swaged narrow (metric dimensions)

ME bore code **5** to **20**

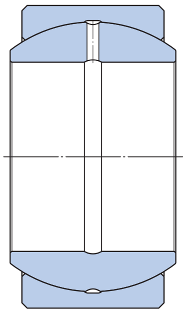
Technical specification	–
Product standards	–



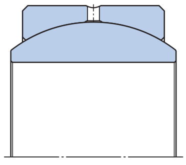
ME..



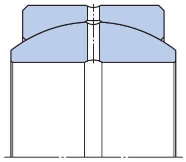
ME..R



MES..



MEC..



MEY..

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	Mass ≈	Static limit loads Radial C_s	Axial C_a[1]	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

---

[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMES22RXTT-2CP6R10
QMEC30PPCP109

Z	WQ	ME	S	22	R	X	TT	-2	CP6	R10

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**	**Outer 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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

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[2]	Passivated corrosion-resistant steel inner ring

Oversize

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

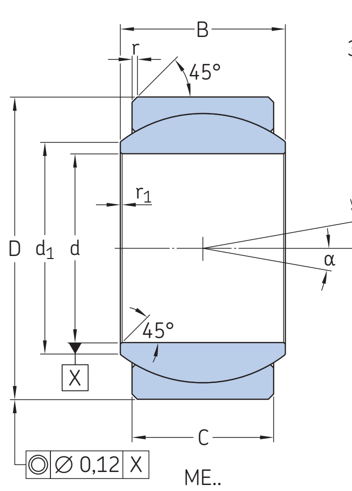
---

[2] Available only for inner ring in corrosion-resistant steel material
[3] No groove in the outer ring sphere for d ≤ 6
[4] Only available for d ≥ 6

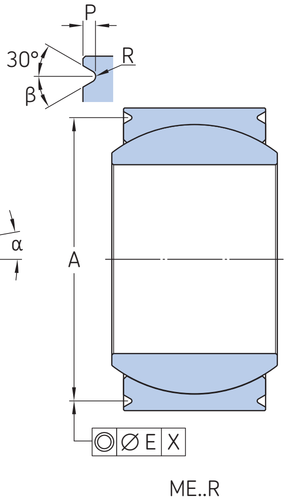
2.6 Metal-to-metal swaged narrow (metric dimensions)

ME bore code **22** to **50**

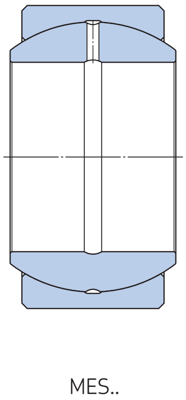
Technical specification	–
Product standards	–



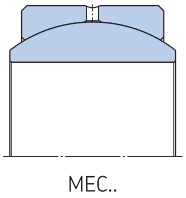
ME..



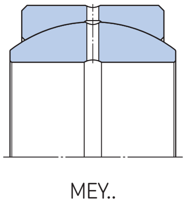
ME..R



MES..



MEC..



MEY..

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 d_1 ≈	A +0,1/0	P 0/–0,2	R +0,1/0	r	r_1 +0,3/0	α	Mass ≈	Static limit loads Radial C_s	Axial C_a1)	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

[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMES22RXTT-2CP6R10
QMEC30PPCP109

Z WQ ME S 22 R X TT -2 CP6 R10

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**	**Outer 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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

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[2]	Passivated corrosion-resistant steel inner ring

Oversize

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

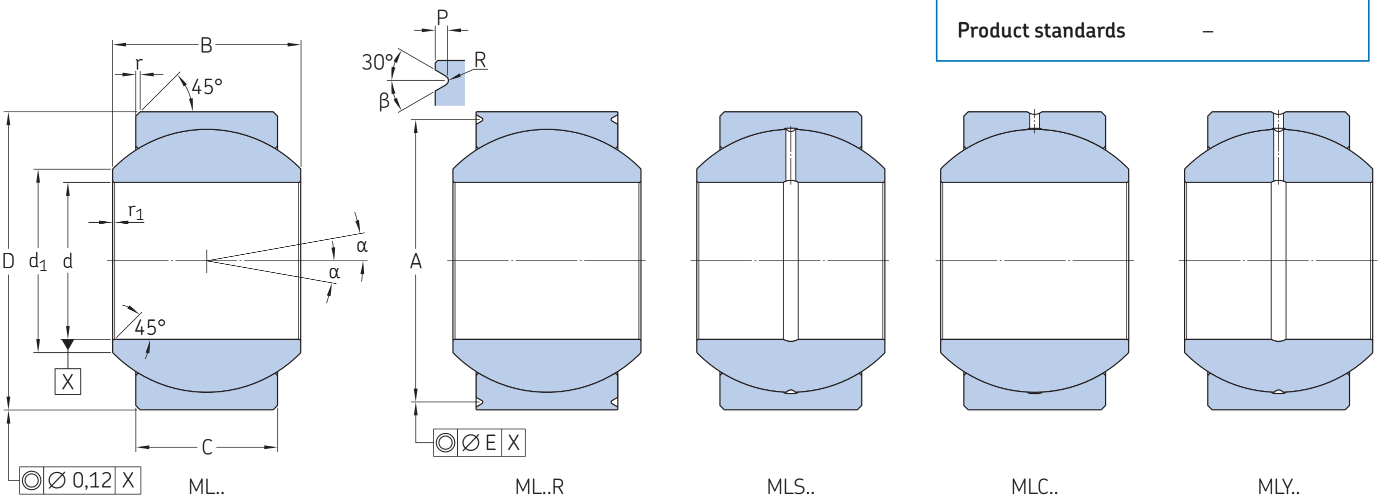
---

[2] Available only for inner ring in corrosion-resistant steel material
[3] No groove in the outer ring sphere for d ≤ 6
[4] Only available for d ≥ 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	
5	5	0/–8	16	0/–8	8,5	11
6	6	0/–8	16	0/–8	8,5	11
8	8	0/–8	18	0/–8	8	11
10	10	0/–8	21	0/–9	10	12,5
12	12	0/–8	26	0/–9	13	16
15	15	0/–8	29	0/–9	13,5	17
17	17	0/–8	30	0/–9	14,5	18
20	20	0/–10	35	0/–11	16	20

Dimensions cont., loads and clearance

Nominal bore code	**Dimensions** d_1 ≈	A +0,1/0	P 0/–0,2	R +0,1/0	r	r_1 +0,3/0	α	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a1)	**Axial clearance** Reduced	Standard
–	mm						°	g	kN		µm	
5	7,7	14,2	0,7	0,2	0,5/0,8	0,1	15	16	42,6	7,2	5/35	35/75
6	7,7	14,2	0,7	0,2	0,5/0,8	0,1	15	16	42,6	7,2	5/35	35/75
8	10,3	16,2	0,7	0,2	0,5/0,8	0,1	14	17	45,7	6,4	5/35	35/75
10	12,2	18,4	0,9	0,3	0,5/0,8	0,1	10	27	68,7	11,7	5/35	35/75
12	15,5	23,4	0,9	0,3	0,5/0,8	0,1	10	49	116,4	21,5	5/35	35/75
15	18,9	26,4	0,9	0,3	0,5/0,8	0,1	9	62	139	24,1	5/35	35/75
17	20,1	27,4	0,9	0,3	0,5/0,8	0,1	9	69	159,1	29	5/40	40/80
20	23,5	31,8	1,4	0,3	0,5/0,8	0,1	8	104	207,5	36	5/40	40/80

---

1) These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMLS20RXTT-2CP6R10
QMLC30PPCP109

Z	WQ	ML	S	20	R	X	TT	-2	CP6	R10

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**	**Outer 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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
–2	Grease G395

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[2]	Passivated corrosion-resistant steel inner ring

Oversize

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

---

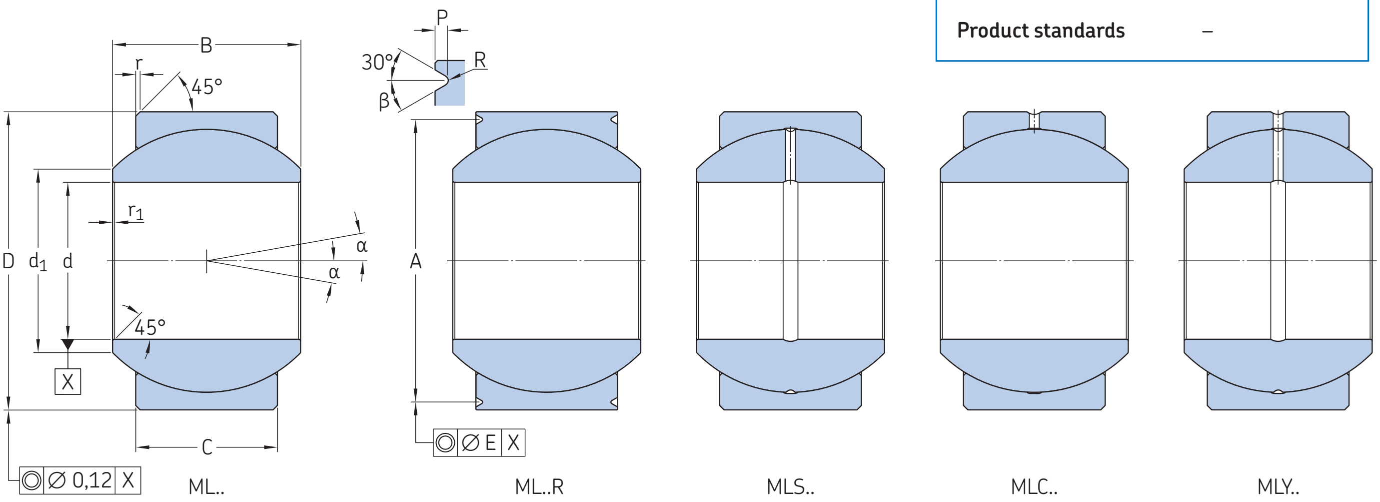
[2] Available only for inner ring in corrosion-resistant steel material
[3] No groove in the outer ring sphere for d ≤ 6
[4] Only available for d ≥ 6

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 d_1 ≈	A +0,1/0	P 0/-0,2	R +0,1/0	r	r_1 +0,3/0	α	Mass ≈	Static limit loads Radial C_s	 Axial C_a[1]	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

---

[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMLS20RXTT-2CP6R10
QMLC30PPCP109

Z WQ ML S 20 R X TT -2 CP6 R10

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**	**Outer 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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
–2	Grease G395

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[2]	Passivated corrosion-resistant steel inner ring

Oversize

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

---

[2] Available only for inner ring in corrosion-resistant steel material

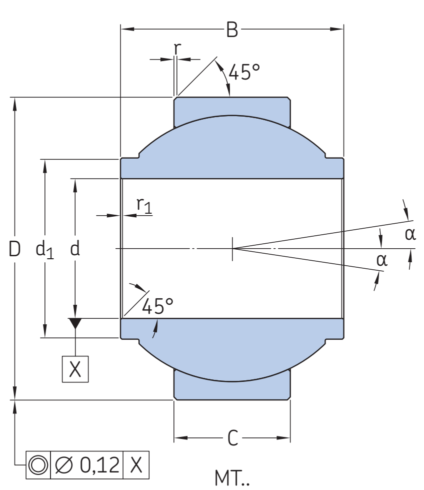
[3] No groove in the outer ring sphere for d ≤ 6

[4] Only available for d ≥ 6

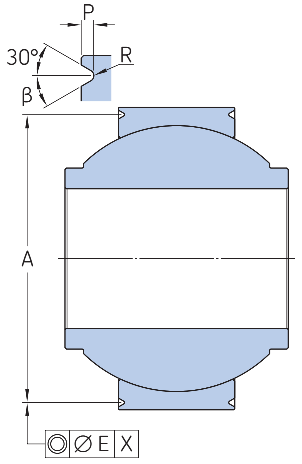
2.8 Metal-to-metal swaged high misalignment (metric dimensions)

MT

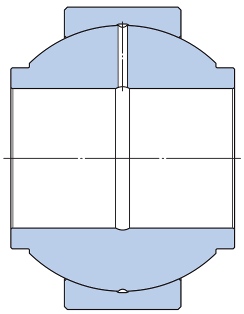
Technical specification	–
Product standards	–



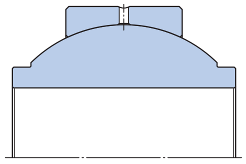
MT..



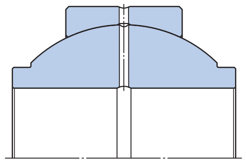
MT..R



MTS..



MTC..



MTY..

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_1 ≈	A +0.15/0	P 0/-0,2	R +0,1/0	r +0,3/0	r_1 +0,3/0	α	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[1]	**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

---

[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples:	ZWQMTS20RXTT-2CP6R10 QMT30PPCP109

Z WQ MT S 20 R X TT -2 CP6 R10

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**	**Outer 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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

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[2]	Passivated corrosion-resistant steel inner ring

Oversize

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

---

[2] Available only for inner ring in corrosion-resistant steel material

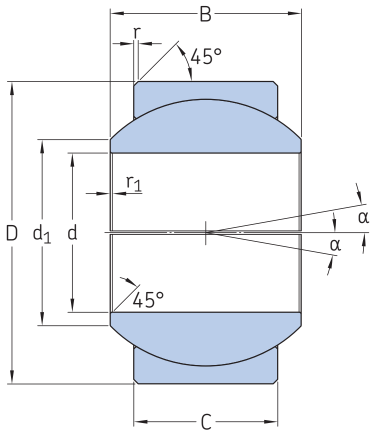
[3] No groove in the outer ring sphere for d ≤ 6

[4] Only available for d ≥ 6

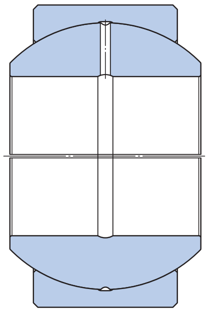
2.9 Metal-to-metal split (metric dimensions)

2PL..

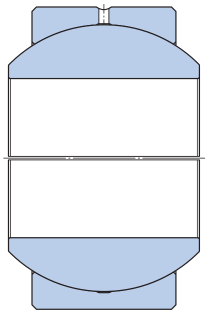
Technical specification	–
Product standards	–



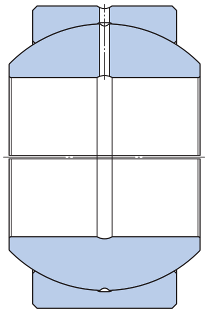
2PL..



2PLS..



2PLC..



2PLY..

Dimensions

Nominal bore code	Dimensions d	Δdmp	D	ΔDmp	C ±1	B 0/–0,06
–	mm	µm	mm	µm	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 d_1 ≈	r +0,3/0	r_1 +0,3/0	α	Mass ≈	Static limit loads Radial C_s	Axial C_a	Radial clearance
–	mm			°	g	kN		µm
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

Designation system

Examples: ZW2PLS20TT-2CP6R10
Q2PLC30PPCP109

Z	W	2PL	S	20	TT	-2	CP6	R10

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	Outer 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	Lubrication by outer ring
Y	Lubrication by inner and outer ring

Bore code

Shield and seal

No code	No shield and seal
TT	Sealed
PP	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP6	Chromium plated
CP109	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55[1]	Passivated corrosion-resistant steel inner ring

Oversize

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

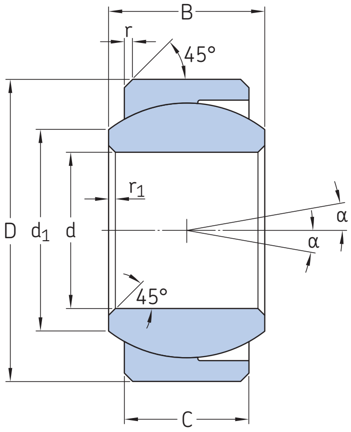
---

[1] Available only for inner ring in corrosion-resistant steel material

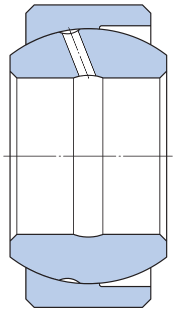
2.10 Metal-to-metal loader slot wide (inch dimensions)

GT..

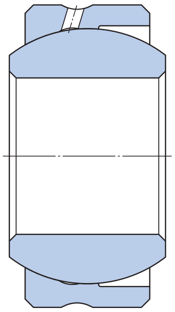
Technical specification	–
Product standards	–



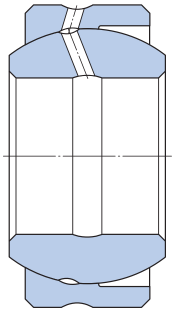
GT..



GTS..



GTC..



GTY..

Dimensions

Nominal bore code	Dash number multiples of $^1/_{16}$ inch	Dimensions d 0/–0.0005 0/–0,0127	D 0/–0.0005 0/–0,0127	C ±0.005 ±0,127	B 0/–0.002 0/–0,051	d_1 ≈	r_1 ±0.005 ±0,127	r +0.010/0 +0.254/0	α
–		in/*mm*							°
12,7	**08**	0.5000 *12,700*	1.0000 *25,400*	0.390 *9,906*	0.500 *12,700*	0.600 *15,240*	0.010 *0,254*	0.020 *0,508*	8
14,29	**09**	0.5625 *14,288*	1.0937 *27,780*	0.437 *11,100*	0.562 *14,275*	0.670 *17,018*	0.010 *0,254*	0.020 *0,508*	9
15,87	**10**	0.6250 *15,875*	1.1875 *30,162*	0.500 *12,700*	0.625 *15,875*	0.739 *18,770*	0.010 *0,254*	0.020 *0,508*	8
19,05	**12**	0.7500 *19,050*	1.4375 *36,512*	0.593 *15,062*	0.750 *19,050*	0.920 *23,368*	0.010 *0,254*	0.030 *0,762*	8
22,22	**14**	0.8750 *22,225*	1.5625 *39,688*	0.703 *17,856*	0.875 *22,225*	0.980 *24,892*	0.010 *0,254*	0.030 *0,762*	8
25,4	**16**	1.0000 *25,400*	1.7500 *44,450*	0.797 *20,244*	1.000 *25,400*	1.118 *28,397*	0.010 *0,254*	0.030 *0,762*	9
31,75	**20**	1.2500 *31,750*	2.0000 *50,800*	0.937 *23,800*	1.093 *27,762*	1.445 *36,700*	0.010 *0,254*	0.030 *0,762*	6
38,10	**24**	1.5000 *38,100*	2.4375 *61,912*	1.135 *28,830*	1.312 *33,320*	1.870 *47,500*	0.010 *0,254*	0.030 *0,762*	6
44,45	**28**	*1.7500* 44,450	*2.8750* 73,025	*1.000* 25,400	*1.125* 28,575	*2.252* *57,200*	*0.010* *0,254*	*0.030* *0,762*	4

Designation system

Examples:	ZWGTS12,7E-2CP6RP01 QGTC24,4EECP109	Z	W	GT	S	12,7	E	-2	CP6	RP01

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Material

No code	Bearing steel inner ring and outer ring
W	Corrosion-resistant steel inner ring and outer ring
Q	Bronze beryllium inner ring and corrosion-resistant steel outer ring

Basic designation

Lubrication grooves and axial clearance

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

Bore code

Seal

No code	No seal
E	Sealed on the slot side
EE	Sealed on both sides

Lubricant

No code	Grease G354
–2	Grease G395

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)
CP551)	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

---

1) 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**2) Radial C_s	Axial C_a	**Axial clearance** Standard GT	Reduced GTS GTC GTY
–		lb/g	lbf/kN		in/µm	
12,7	**08**	0.07 30	20 520 91,2	1 395 6,2	0.0002/0.0010 5/25	0.0006/0.0015 15/38
14,29	**09**	0.09 39	26 460 117,6	1 800 8,0	0.0002/0.0010 5/25	0.0006/0.0015 15/38
15,87	**10**	0.11 52	32 940 146,4	2 452 10,9	0.0002/0.0010 5/25	0.0006/0.0015 15/38
19,05	**12**	0.20 92	47 655 211,8	3 465 15,4	0.0004/0.0012 10/32	0.0007/0.0018 19/45
22,22	**14**	0.26 0,117	62 640 278,4	4 972 22,1	0.0004/0.0012 10/32	0.0007/0.0018 19/45
25,4	**16**	0.37 170	89 550 398,0	7 178 31,9	0.0004/0.0012 10/32	0.0007/0.0018 19/45
31,75	**20**	0.51 230	126 517 562,3	10 102 44,9	0.0006/0.0015 10/32	0.0010/0.0020 25/51
38,10	**24**	0.86 0,390	188 437 837,5	16 132 71,7	0.0006/0.0015 10/32	0.0010/0.0020 25/51
44,45	**28**	1.17 530	202 500 900,0	12 532 55,7	0.0006/0.0015 10/32	0.0010/0.0020 25/51

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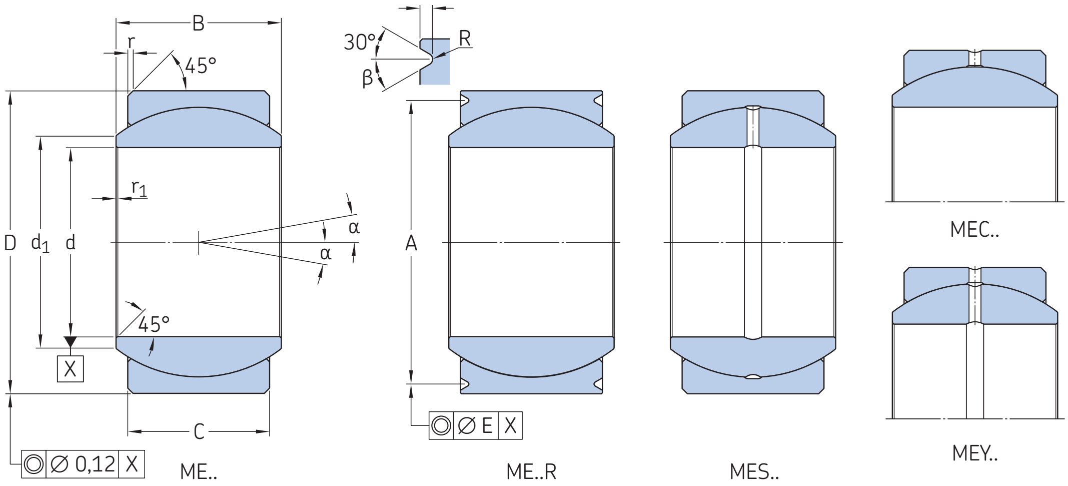
2) Loads are given in the opposite direction to the slots

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) AS 21155 (chamfered)



d	β	E
in/mm	°	in/mm
0.1900/0.3125 *4,826/7,937*	20	0.003 *0,076*
0.3750/1.7500 *9,525/44,450*	30	0.005 *0,127*

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_1 ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,200*	P 0/–0.010 *0/–0,254*
–		in/*mm*								
4,83	**03**	0.1900 *4,826*	0.5625 *14,288*	0.218 *5,537*	0.281 *7,137*	0.293 *7,442*	0.010 *0,254*	0.010 *0,254*	0.502 *12,751*	0.030 *0,762*
6,35	**04**	0.2500 *6,350*	0.6562 *16,667*	0.250 *6,350*	0.343 *8,712*	0.364 *9,246*	0.010 *0,254*	0.010 *0,254*	0.596 *15,140*	0.030 *0,762*
7,94	**05**	0.3125 *7,937*	0.7500 *19,050*	0.281 *7,137*	0.375 *9,525*	0.419 *10,643*	0.010 *0,254*	0.010 *0,254*	0.662 *16,815*	0.040 *1,016*
9,52	**06**	0.3750 *9,525*	0.8125 *20,637*	0.312 *7,925*	0.406 *10,312*	0.475 *12,065*	0.010 *0,254*	0.020 *0,508*	0.714 *18,136*	0.040 *1,016*
11,11	**07**	0.4375 *11,112*	0.9062 *23,017*	0.343 *8,712*	0.437 *11,100*	0.530 *13,462*	0.010 *0,254*	0.020 *0,508*	0.808 *20,523*	0.040 *1,016*
12,7	**08**	0.5000 *12,700*	1.0000 *25,400*	0.390 *9,906*	0.500 *12,700*	0.600 *15,240*	0.010 *0,254*	0.020 *0,508*	0.878 *22,301*	0.060 *1,524*
14,29	**09**	0.5625 *14,288*	1.0937 *27,780*	0.437 *11,100*	0.562 *14,275*	0.670 *17,018*	0.010 *0,254*	0.020 *0,508*	0.972 *24,689*	0.060 *1,524*

Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions R	α	Mass ≈	Static limit loads Radial C_s	Axial C_a[1]	Radial clearance Max For products per AS standard	Axial clearance	Standard For other products	Reduced
–		in/*mm*	°	lb/*g*	lbf/*kN*		in/*µm*			
4,83	**03**	0.005/0.010 *0.127/0.254*	10	0.02 *9*	6 300 *28*	2 475 *11*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
6,35	**04**	0.005/0.010 *0.127/0.254*	13	0,02 *9*	9 450 *42*	3 600 *16*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
7,94	**05**	0.005/0.010 *0.127/0.254*	10	0.03 *14*	12 825 *57*	5 175 *23*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
9,52	**06**	0.010/0.020 *0.254/0.508*	9	0.04 *18*	15 750 *70*	5 625 *25*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
11,11	**07**	0.010/0.020 *0.254/0.508*	8	0.05 *22*	19 125 *85*	7 650 *34*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
12,7	**08**	0.010/0.020 *0.254/0.508*	8	0.07 *31*	24 750 *110*	8 775 *39*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
14,29	**09**	0.010/0.020 *0.254/0.508*	9	0.09 *40*	32 400 *144*	10 575 *47*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*

---

[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMES12,7RXTT-2CP6RP01
QME25,4PPCP109

Z	WQ	ME	S	12,7	R	X	TT	-2	CP6	RP01

Surface treatment of outer ring

No code1)	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
Q1)	Bronze beryllium	Corrosion-resistant steel
WQ	Corrosion-resistant steel	Bronze aluminium

Basic designation

Lubrication grooves

No code1)	Without lubrication groove
S1)	Lubrication by inner ring
C1) 3)	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
X1)	Reduced axial clearance

Shield and seal

No code	No shield and seal
TT1) 4)	Sealed
PP1) 4)	Shielded

Lubricant

No code1)	Grease G354
–21)	Grease G395
–3	Grease G353

Surface treatment of inner ring

No code1)	Not plated
CP6	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP552)	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

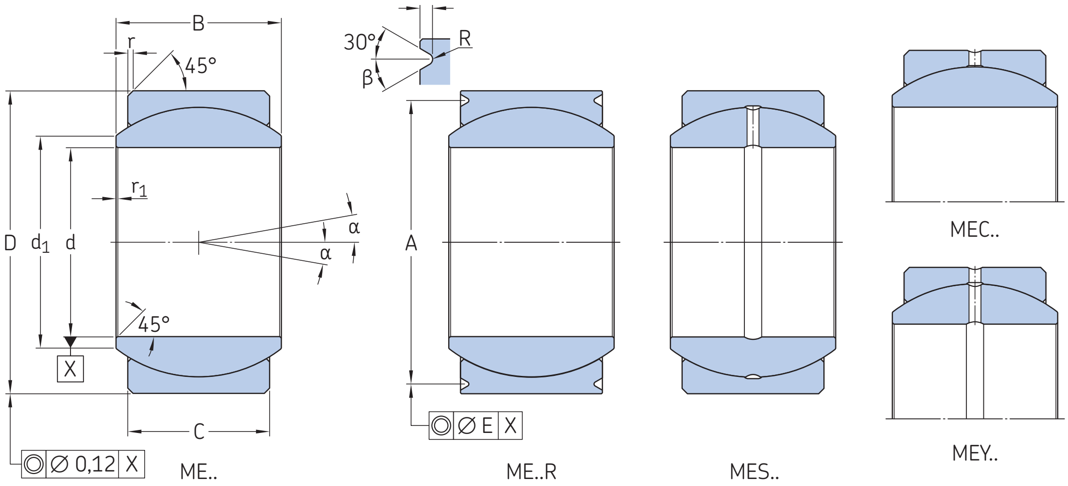
---

1) SKF option
2) SKF option, available only for inner ring in corrosion-resistant steel material
3) No groove in the outer ring sphere for d ≤ 7,94
4) Only available for d ≥ 7,94

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) AS 21155 (chamfered)



d	β	E
in/*mm*	°	in/*mm*
0.1900/0.3125 *4,826/7,937*	20	0.003 *0,076*
0.3750/1.7500 *9,525/44,450*	30	0.005 *0,127*

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_1 ≈	r_1 ±0.005 *±0,127*	r 0/–0.010 *0/–0,254*	A 0/–0.008 *0/–0,200*	P 0/–0.010 *0/–0,254*
–		in/*mm*								
15,87	**10**	0.6250 *15,875*	1.1875 *30,162*	0.500 *12,700*	0.625 *15,875*	0.739 *18,770*	0.010 *0,254*	0.020 *0,508*	1.065 *27,051*	0.060 *1,524*
19,05	**12**	0.7500 *19,050*	1.4375 *36,512*	0.593 *15,062*	0.750 *19,050*	0.920 *23,368*	0.010 *0,254*	0.030 *0,762*	1.315 *33,401*	0.060 *1,524*
22,22	**14**	0.8750 *22,225*	1.5625 *39,688*	0.703 *17,856*	0.875 *22,225*	0.980 *24,892*	0.010 *0,254*	0.030 *0,762*	1.440 *36,576*	0.060 *1,524*
25,4	**16**	1.0000 *25,400*	1.7500 *44,450*	0.797 *20,244*	1.000 *25,400*	1.118 *28,397*	0.010 *0,254*	0.030 *0,762*	1.628 *41,351*	0.060 *1,524*
31,75 2)	**20**	1.2500 *31,750*	2.0000 *50,800*	0.937 *23,800*	1.093 *27,762*	1.445 *36,700*	0.010 *0,254*	0.030 *0,762*	1.878 *47,701*	0.060 *1,524*
38,10 2)	**24**	1.5000 *38,100*	2.4375 *61,912*	1.135 *28,830*	1.312 *33,320*	1.870 *47,500*	0.010 *0,254*	0.030 *0,762*	2.317 *58,850*	0.060 *1,524*
44,4 2)	**28**	1.7500 *44,450*	2.8750 *73,025*	1.000 *25,400*	1.125 *28,575*	2.252 *57,200*	0.010 *0,254*	0.030 *0,762*	2.753 *69,930*	0.060 *1,524*

Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions R	α	Mass ≈	Static limit load Radial C_s	Axial C_a 1)	Radial clearance For products per AS standard	Axial clearance Max	Standard For other products	Reduced
–		in/*mm*	°	lb/*g*	lbf/*kN*		in/*µm*			
15,87	**10**	0.010/0.020 *0.254/0.508*	8	0.12 *54*	41 175 *183*	14 175 *63*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
19,05	**12**	0.010/0.020 *0.254/0.508*	8	0.21 *95*	59 850 *266*	19 125 *85*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
22,22	**14**	0.010/0.020 *0.254/0.508*	8	0.27 *122*	78 750 *350*	27 900 *124*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
25,4	**16**	0.010/0.020 *0.254/0.508*	9	0.39 *176*	101 700 *452*	35 550 *158*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
31,75 2)	**20**	0.010/0.020 *0.254/0.508*	6	0.53 *240*	142 875 *635*	52 875 *235*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
38,10 2)	**24**	0.010/0.020 *0.254/0.508*	6	0.89 *405*	216 675 *963*	81 675 *363*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
44,45 2)	**28**	0.010/0.020 *0.254/0.508*	4	1.20 *545*	216 675 *963*	50 829 *226*	0.0005/0.0020 *12,7/50*	0.010 *254*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*

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1) These values can be limited by the unstaking load (contact SKF for more information)

2) SKF option

Designation system

Examples: ZWQMES12,7RXTT-2CP6RP01
QME25,4PPCP109

Z	WQ	ME	S	12,7	R	X	TT	-2	CP6	RP01

Surface treatment of outer ring

No code1)	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
Q1)	Bronze beryllium	Corrosion-resistant steel
WQ	Corrosion-resistant steel	Bronze aluminium

Basic designation

Lubrication grooves

No code1)	Without lubrication groove
S1)	Lubrication by inner ring
C1) 3)	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
X1)	Reduced axial clearance

Shield and seal

No code	No shield and seal
TT1) 4)	Sealed
PP1) 4)	Shielded

Lubricant

No code1)	Grease G354
–21)	Grease G395
–3	Grease G353

Surface treatment of inner ring

No code1)	Not plated
CP6	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP552)	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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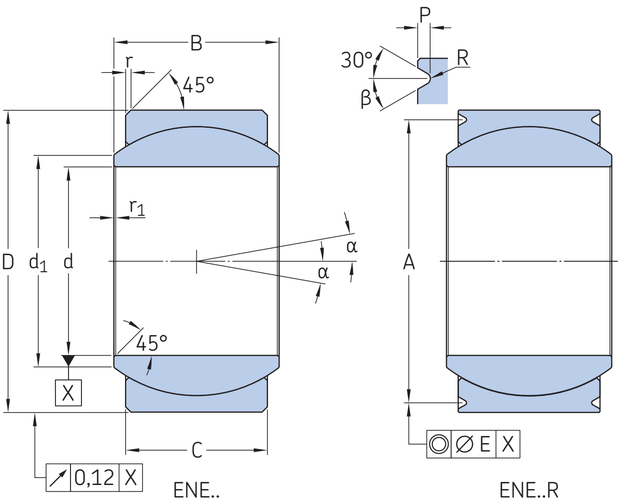
1) SKF option
2) SKF option, available only for inner ring in corrosion-resistant steel material
3) No groove in the outer ring sphere for d ≤ 7,94
4) Only available for d ≥ 7,94

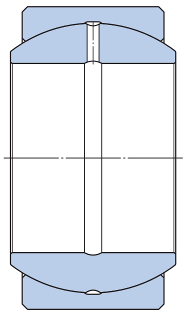
2.12 Metal-to-metal swaged narrow (inch dimensions)

ENE.. bore code **4,83** to **15,87**

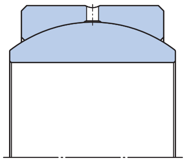


ENE..

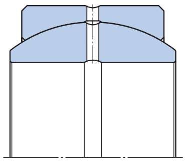
ENE..R



ENES..



ENEC..



ENEY..

Technical specification	EN 2337
Product standards	EN 6046
Materials	Corrosion-resistant steel inner ring and outer ring
Surface treatment:	Inner ring passivated

d	β	E
in/*mm*	°	in/*mm*
0.1900/0.3125 *4,826/7,937*	20	0.003 *0,076*
0.3750/1.7500 *9,525/44,450*	30	0.005 *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*							
4,83	**03**	0.1900 *4,826*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.5625 *14,288*	0/–0.0003 *0/–0,008*	0/-0.0005 *0/-0,013*	0.218 *5,537*	0.281 *7,137*
6,35	**04**	0.2500 *6,350*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.6562 *16,667*	0/–0.0003 *0/–0,008*	0/-0.0005 *0/-0,013*	0.250 *6,350*	0.343 *8,712*
7,94	**05**	0.3125 *7,937*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.7500 *19,050*	0/–0.0003 *0/–0,008*	0/-0.0005 *0/-0,013*	0.281 *7,137*	0.375 *9,525*
9,52	**06**	0.3750 *9,525*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.8125 *20,637*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.312 *7,925*	0.406 *10,312*
11,11	**07**	0.4375 *11,112*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.9062 *23,017*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.343 *8,712*	0.437 *11,100*
12,7	**08**	0.5000 *12,700*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.0000 *25,400*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.390 *9,906*	0.500 *12,700*
14,29	**09**	0.5625 *14,288*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.0937 *27,780*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.437 *11,100*	0.562 *14,275*
15,87	**10**	0.6250 *15,875*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.1875 *30,162*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.500 *12,700*	0.625 *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/–0,200*	P 0/–0.010 *0/–0,254*	R	α	Mass ≈
–		in/*mm*						°	lb/*g*
4,83	**03**	0.293 *7,442*	0.010 *0,254*	0.025 *0,635*	0,500 *12,700*	0.025 *0,640*	0.0050/0.0100 *0,127/0,254*	10	0.02 *7*
6,35	**04**	0.364 *9,246*	0.010 *0,254*	0.025 *0,635*	0,594 *15,088*	0.025 *0,640*	0.0050/0.0100 *0,127/0,254*	13	0.02 *11*
7,94	**05**	0.419 *10,643*	0.010 *0,254*	0.025 *0,635*	0,660 *16,764*	0.035 *0,890*	0.0050/0.0100 *0,127/0,254*	11	0.03 *14*
9,52	**06**	0.475 *12,065*	0.010 *0,254*	0.030 *0,762*	0,712 *18,085*	0.035 *0,890*	0.0100/0.0170 0,254/0,432	9	0.04 *18*
11,11	**07**	0.530 *13,462*	0.010 *0,254*	0.030 *0,762*	0,808 *20,523*	0.035 *0,890*	0.0100/0.0170 0,254/0,432	9	0.05 *23*
12,7	**08**	0.600 *15,24*	0.010 *0,254*	0.030 *0,762*	0,876 *22,250*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	9	0.07 *32*
14,29	**09**	0.670 *17,018*	0.010 *0,254*	0.030 *0,762*	0,970 *24,638*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	10	0.09 *41*
15,87	**10**	0.739 *18,770*	0.010 *0,254*	0.030 *0,762*	1,063 *27,000*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	9	0.12 *54*

Designation system

Examples: ZENES12,7RXTT-2CP6RP01
ENEC25,4PPCP109

Z ENE S 12,7 R X TT –2 CP6 RP01

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Lubrication grooves

No code	Without lubrication groove
S	Lubrication by inner ring
C3)	Lubrication by outer ring
Y1)	Lubrication by inner and outer ring

Bore code

Chamfer and groove

No code	Chamfered outer ring
R	Grooved outer ring

Clearances

No code	Standard clearances
X	Reduced clearances

Shield and seal

No code	No shield and seal
TT1) 4)	Sealed
PP1) 4)	shielded

Lubricant

No code	Grease G354
–2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP61)	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP552)	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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1) SKF option
2) Available only for inner ring in corrosion-resistant steel material
3) No groove in the outer ring sphere for d ≤ 7,94
4) Only available for d ≥ 7,94

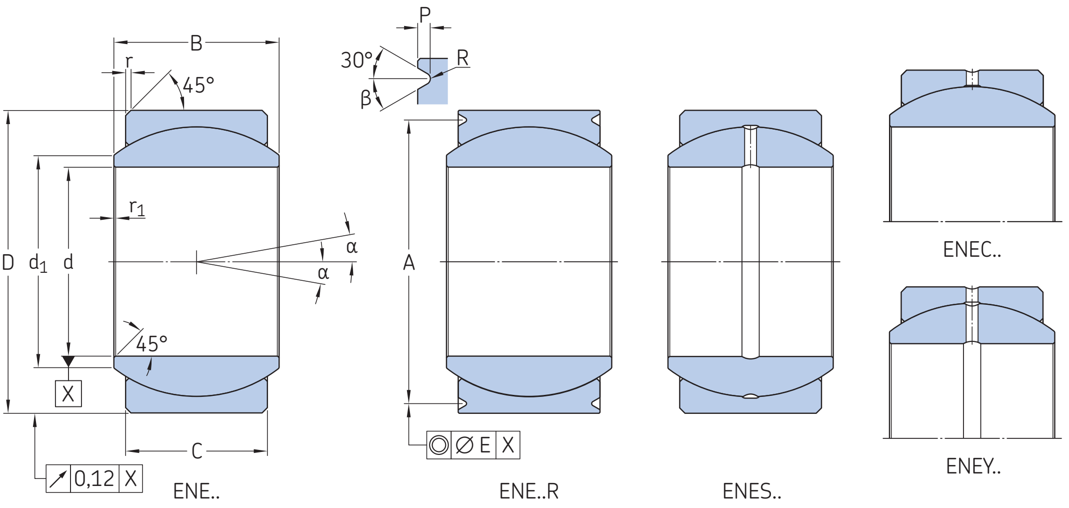
Loads and clearance

Nominal bore code	**Dash number** multiples of 1/16 inch	**Static limit loads** Radial C_s	Axial C_a 4)	**Standard clearances** Radial	Axial max	**Reduced clearances** Radial	Axial max
–		lbf/*kN*		in/*µm*			
4,83	03	6 300 *28*	2 475 *11*	0.0004/0.0012 *10/30*	0.0050 *127*	0.0001/0.0004 *2/10*	0.0014 *35*
6,35	04	9 450 *42*	3 600 *16*	0.0004/0.0012 *10/30*	0.0050 *127*	0.0001/0.0004 *2/10*	0.0014 *35*
7,94	05	12 825 *57*	5 175 *23*	0.0004/0.0012 *10/30*	0.0050 *127*	0.0001/0.0004 *2/10*	0.0014 *35*
9,52	06	15 750 *70*	5 625 *25*	0.0004/0.0012 *10/30*	0.0050 *127*	0.0001/0.0004 *2/10*	0.0014 *35*
11,11	07	19 125 *85*	7 650 *34*	0.0004/0.0012 *10/30*	0.0050 *127*	0.0001/0.0004 *2/10*	0.0014 *35*
12,7	08	24 750 *110*	8 775 *39*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0001/0.0004 *2/10*	0.0014 *35*
14,29	09	32 400 *144*	10 575 *47*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0001/0.0005 *3/12*	0.0016 *40*
15,87	10	41 175 *183*	14 175 *63*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0001/0.0005 *3/12*	0.0016 *40*

4) These values can be limited by unstaking load (contact SKF for more information)

2.12 Metal-to-metal swaged narrow (inch dimensions)

ENE.. bore code **19,05** to **50,8**



Technical specification	EN 2337
Product standards	EN 6046
Materials	Corrosion-resistant steel inner ring and outer ring
Surface treatment:	Inner ring passivated

d	β	E
in/*mm*	°	in/*mm*
0.1900/0.3125 *4,826/7,937*	20	0.003 *0,076*
0.3750/1.7500 *9,525/44,450*	30	0.005 *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*							
19,05	**12**	0.7500 *19,050*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.4375 *36,512*	0/–0.0004 *0/–0,011*	0/-0.0005 *0/-0,013*	0.593 *15,062*	0.750 *19,050*
22,22	**14**	0.8750 *22,225*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.5625 *39,688*	0/–0.0004 *0/–0,011*	0/-0.0005 *0/-0,013*	0.703 *17,856*	0.875 *22,225*
25,4	**16**	1.0000 *25,400*	0/–0.005 *0/–0,127*	+0.0001/-0.0006 *+0,003/-0,015*	1.7500 *44,450*	0/–0.0005 *0/–0,013*	+0.0001/-0.0006 *+0,003/-0,015*	0.797 *20,244*	1.000 *25,400*
31,75	**20**	1.2500 *31,750*	0/–0.005 *0/–0,127*	+0.0001/-0.0006 *+0,003/-0,015*	2.0000 *50,800*	0/–0.0005 *0/–0,013*	+0.0001/-0.0006 *+0,003/-0,015*	0.942 *23,930*	1.093 *27,762*
38,10	**24**	1.5000 *38,100*	0/–0.005 *0/–0,127*	+0.0001/-0.0006 *+0,003/-0,015*	2.4375 *61,912*	0/–0.0005 *0/–0,013*	+0.0001/-0.0006 *+0,003/-0,015*	1.130 *28,700*	1.312 *33,320*
44,45	**28**	1.7500 *44,450*	0/–0.005 *0/–0,127*	+0.0001/-0.0006 *+0,003/-0,015*	2.8125 *71,438*	0/–0.0005 *0/–0,013*	+0.0001/-0.0006 *+0,003/-0,015*	1.317 *33,450*	1.531 *38,890*
50,8	**32**	2.0000 *50,800*	0/–0.005 *0/–0,127*	+0.0001/-0.0006 *+0,003/-0,015*	3.1875 *80,963*	0/–0.0005 *0/–0,013*	+0.0001/-0.0006 *+0,003/-0,015*	1.505 *38,230*	1.750 *44,450*

Dimensions cont.

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions							Mass
		d_1 ≈	r_1 ±0.005 *±0,127*	r 0/–0.010 *0/–0,254*	A 0/–0.008 *0/–0,200*	P 0/–0.010 *0/–0,254*	R	α	≈
–		in/*mm*						°	lb/*g*
19,05	**12**	0.920 *23,368*	0.010 *0,254*	0.040 *1,016*	1.313 *33,350*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	9	0.21 *95*
22,22	**14**	0.980 *24,892*	0.010 *0,254*	0.040 *1,016*	1.438 *36,525*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	9	0.27 *122*
25,4	**16**	1.118 *28,397*	0.010 *0,254*	0.040 *1,016*	1.626 *41,300*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	9	0.38 *173*
31,75	**20**	1.445 *36,700*	0.010 *0,254*	0.040 *1,016*	1.876 *47,650*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	6	0.53 *240*
38,10	**24**	1.870 *47,500*	0.010 *0,254*	0.040 *1,016*	2.313 *58,750*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	6	0.97 *439*
44,45	**28**	1.996 *50,70*	0.010 *0,254*	0.040 *1,016*	2.688 *68,280*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	6	1.47 *668*
50,8	**32**	2.440 *61 980*	0.010 *0,254*	0.040 *1,016*	3.064 *77,830*	0.055 *1,400*	0.0100/0.0170 0,254/0,432	5	2.16 *980*

Designation system

Examples: ZENES12,7RXTT-2CP6RP01
ENEC25,4PPCP109

Z ENE S 12,7 R X TT –2 CP6 RP01

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Lubrication grooves

No code	Without lubrication groove
S	Lubrication by inner ring
C3)	Lubrication by outer ring
Y1)	Lubrication by inner and outer ring

Bore code

Chamfer and groove

No code	Chamfered outer ring
R	Grooved outer ring

Clearances

No code	Standard clearances
X	Reduced clearances

Shield and seal

No code	No shield and seal
TT1) 4)	Sealed
PP1) 4)	shielded

Lubricant

No code	Grease G354
–2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP61)	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP552)	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

---

1) SKF option
2) Available only for inner ring in corrosion-resistant steel material
3) No groove in the outer ring sphere for d ≤ 7,94
4) Only available for d ≥ 7,94

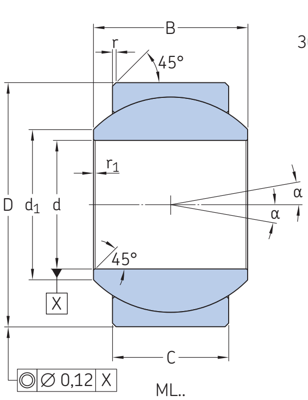
Loads and clearance

Nominal bore code	**Dash number** multiples of 1/16 inch	**Static limit loads** Radial C_s	Axial C_a 4)	**Standard clearances** Radial	Axial max	**Reduced clearances** Radial	Axial max
–		lbf/kN		in/*µm*			
19,05	**12**	59 850 *266*	19 125 *85*	0.0004/0.0020 *10/50*	0.0090/229 0.0090/229	0.00015/0.0006 *4/15*	0.0020 *50*
22,22	**14**	78 750 *350*	27 900 *124*	0.0004/0.0020 *10/50*	0.0090/229 0.0090/229	0.00015/0.0006 *4/15*	0.0020 *50*
25,4	**16**	101 700 *452*	35 550 *158*	0.0004/0.0020 *10/50*	0.0090/229 0.0090/229	0.00015/0.0006 *4/15*	0.0020 *50*
31,75	**20**	142 875 *635*	52 875 *235*	0.0004/0.0020 *10/50*	0.0090/229 0.0090/229	0.00015/0.0006 *4/15*	0.0020 *50*
38,10	**24**	216 675 *963*	81 675 *363*	0.0004/0.0020 *10/50*	0.0090/229 0.0090/229	0.0001/0.0004 *4/15*	0.0020 *50*
44,45	**28**	282 375 *1 255*	108 000 *480*	0.0004/0.0020 *10/50*	0.0090/229 0.0090/229	0.00015/0.0006 *4/15*	0.0020 *50*
50,8	**32**	387 000 *1 720*	148 725 *661*	0.0004/0.0020 *10/50*	0.0090/229 0.0090/229	0.0002/0.0008 *5/20*	0.0024 *60*

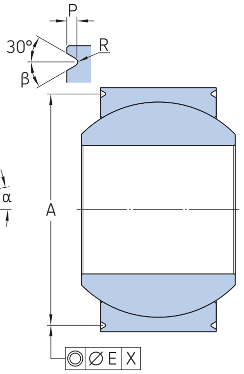
4) These values can be limited by unstaking load (contact SKF for more information)

2.13 Metal-to-metal swaged wide (inch dimensions)

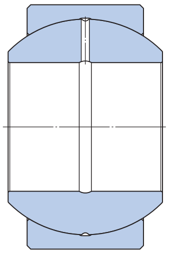
ML.. bore code **4,83** to **15,87**



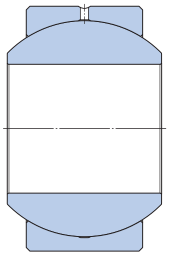
ML..



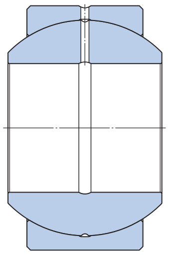
ML..R



MLS..



MLC..



MLY..

Technical specification –

Product standards –

d	β	E
in/mm	°	*in/mm*
0.1900/ 0.2500 *4,826/ 6,35*	20	0.003 *0,076*
0.3125 *7,937*	30	0.003 *0,076*
0.3750/ 2.0000 *9,525/ 50,8*	30	0.005 *0,127*

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_1 ≈	r_1 ±0.005 *±0,127*	r 0.010/–0 *0,254/–0*	A +0.010/0 *+0,254/0*	P 0/–0.010 *0/–0,254*
–		in/*mm*								
4,83	**03**	0.1900 *4,826*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.300 *7,620*	0.010 *0,254*	0.015 *0,381*	0.563 *14,300*	0.025 *0,635*
6,35	**04**	0.2500 *6,350*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.300 *7,620*	0.010 *0,254*	0.015 *0,381*	0.563 *14,300*	0.025 *0,635*
7,94	**05**	0.3125 *7,937*	0.6875 *17,462*	0.317 *8,052*	0.437 *11,100*	0.360 *9,140*	0.010 *0,254*	0.015 *0,381*	0.625 *15,875*	0.025 *0,635*
9,52	**06**	0.3750 *9,525*	0.8125 *20,637*	0.406 *10,312*	0.500 *12,700*	0.466 *11,840*	0.010 *0,254*	0.020 *0,508*	0.712 *18,085*	0.035 *0,889*
11,11	**07**	0.4375 *11,112*	0.9375 *23,812*	0.442 *11,227*	0.562 *14,275*	0.537 *13,64*	0.010 *0,254*	0.020 *0,508*	0.837 *21,260*	0.035 *0,889*
12,7	**08**	0.5000 *12,700*	1.0000 *25,400*	0.505 *12,827*	0.625 *15,875*	0.607 *15,420*	0.010 *0,254*	0.020 *0,508*	0.900 *22,860*	0.035 *0,889*
14,29	**09**	0.5625 *14,288*	1.1250 *28,575*	0.536 *13,614*	0.687 *17,450*	0.721 *18,310*	0.010 *0,254*	0.020 *0,508*	1.025 *26,035*	0.035 *0,889*
15,87	**10**	0.6250 *15,875*	1.1875 *30,162*	0.567 *14,400*	0.750 *19,050*	0.747 *18,970*	0.010 *0,254*	0.020 *0,508*	1.087 *27,610*	0.035 *0,889*

Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions R	α	Mass ≈	Static limit loads Radial C_s	 Axial C_a[1]	Axial clearance Standard	 Reduced
–		in/*mm*	°	lb/*g*	lbf/*kN*		in/*µm*	
4,83	**03**	0.005/0.012 *0,127/0,305*	15	0.03 *14*	12 150 *54*	5 175 *23*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
6,35	**04**	0.005/0.012 *0,127/0,305*	15	0.03 *14*	13 725 *61*	5 850 *26*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
7,94	**05**	0.005/0.012 *0,127/0,305*	14	0.035 *16*	14 175 *63*	5 400 *24*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
9,52	**06**	0.010/0.017 *0,254/0,432*	8	0.06 *27*	21 375 *95*	8 325 *37*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
11,11	**07**	0.010/0.017 *0,254/0,432*	10	0.08 *38*	27 000 *120*	10 575 *47*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
12,7	**08**	0.010/0.017 *0,254/0,432*	9	0.10 *45*	35 550 *158*	13 950 *62*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
14,29	**09**	0.010/0.017 *0,254/0,432*	10	0.14 *61*	43 875 *195*	16 200 *72*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
15,87	**10**	0.010/0.017 *0,254/0,432*	12	0.16 *73*	49 500 *220*	17 775 *79*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*

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[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMLS12,7RXTT-2CP6RP01
QML25,4PPCP109

Z	WQ	ML	S	12,7	R	X	TT	-2	CP6	RP01

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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP6	Chromium plated
CP109	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55[2]	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

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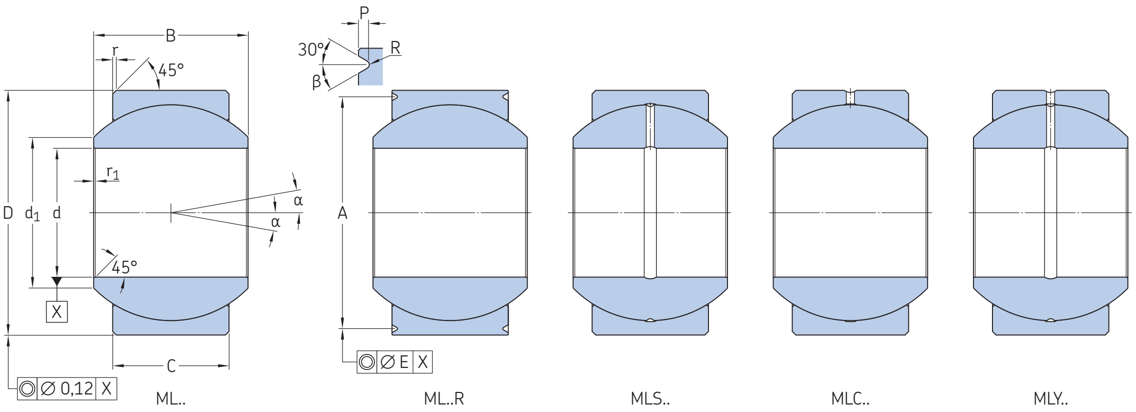
[2] Available only for inner ring in corrosion-resistant steel material
[3] No groove in the outer ring sphere for d ≤ 7,94
[4] Only available for d ≥ 7,94

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/ 0.2500 *4,826/* *6,35*	20	0.003 *0,076*
0.3125 *7,937*	30	0.003 *0,076*
0.3750/ 2.0000 *9,525/* *50,8*	30	0.005 *0,127*

Dimensions

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_1 ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,200*	P 0/–0.010 *0/–0,254*
–		in/*mm*								
19,05	**12**	0.7500 *19,050*	1.3750 *34,925*	0.630 *16,002*	0.875 *22,225*	0.845 *21,460*	0.010 *0,254*	0.030 *0,762*	1.251 *31,775*	0.055 *1,397*
22,22	**14**	0.8750 *22,225*	1.6250 *41,275*	0.755 *19,177*	0.875 *22,225*	0.995 *25,270*	0.010 *0,254*	0.030 *0,762*	1.501 *38,125*	0.055 *1,397*
25,4	**16**	1.0000 *25,400*	2.1250 *53,975*	1.005 *25,527*	1.375 *34,925*	1.269 *32,230*	0.010 *0,254*	0.030 *0,762*	2.001 *50,825*	0.055 *1,397*
31,75	**20**	1.2500 *31,750*	2.3750 *60,325*	1.130 *28,700*	1.500 *38,100*	1.462 *37,150*	0.010 *0,254*	0.030 *0,762*	2.253 *57,230*	0.060 *1,524*
38,10	**24**	1.5000 *38,100*	2.6875 *68,260*	1.223 *31,064*	1.687 *42,850*	1.697 *43,100*	0.010 *0,254*	0.030 *0,762*	2.565 *65,160*	0.060 *1,524*
44,45	**28**	1.7500 *44,450*	3.0000 *76,200*	1.317 *33,450*	1.812 *46,020*	1.965 *49,900*	0.010 *0,254*	0.030 *0,762*	2.878 *73,100*	0.060 *1,524*
50,8	**32**	2.0000 *50,800*	3.2500 *82,550*	1.380 *35,050*	1.937 *49,190*	2.209 *56,100*	0.010 *0,254*	0.030 *0,762*	3.128 *79,451*	0.060 *1,524*

Dimensions cont., loads and clearance

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** R	α	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[1]	**Axial clearance** Standard	Reduced
–		in/*mm*	°	lb/*g*	lbf/*kN*		in/*µm*	
19,05	**12**	0.010/0.017 *0.254/0.432*	13	0.24 *109*	64 125 *285*	20 925 *93*	0.0020/0.0040 *50/100*	0.0002/0.0020 *5/50*
22,22	**14**	0.010/0.017 *0.254/0.432*	6	0.35 *159*	83 250 *370*	31 725 *141*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
25,4	**16**	0.010/0.017 *0.254/0.432*	12	0.97 *440*	158 625 *705*	59 625 *265*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
31,75	**20**	0.010/0.020 *0.254/0.508*	12	1.10 *500*	200 250 *890*	76 500 *340*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
38,10	**24**	0.010/0.020 *0.254/0.508*	13	1.54 *700*	247 500 *1 100*	92 250 *410*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
44,45	**28**	0.010/0.020 *0.254/0.508*	12	1.99 *900*	299 250 *1 330*	108 000 *480*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*
50,8	**32**	0.010/0.020 *0.254/0.508*	12	2.31 *1 050*	344 250 *1 530*	117 000 *520*	0.0024/0.0047 *60/120*	0.0002/0.0024 *5/60*

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[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMLS12,7RXTT-2CP6RP01
QML25,4PPCP109

Z WQ ML S 12,7 R X TT -2 CP6 RP01

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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP6	Chromium plated
CP109	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55[2]	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

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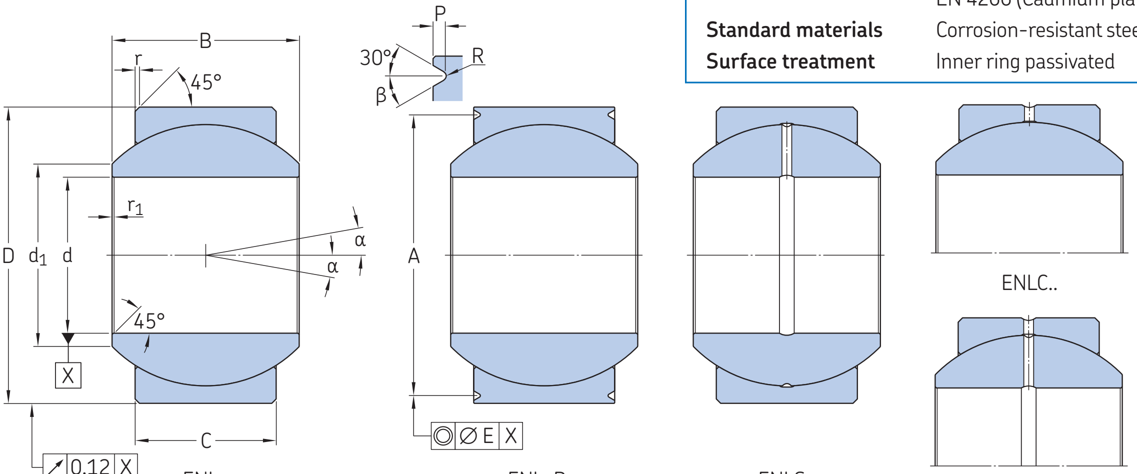
[2] Available only for inner ring in corrosion-resistant steel material
[3] No groove in the outer ring sphere for d ≤ 7,94
[4] Only available for d ≥ 7,94

2.14 Metal-to-metal swaged wide (inch dimensions)

ENL.. bore code **4,83** to **14,29**

Technical specification	EN 2337
Product standards	EN 4265 (Not plated) EN 4266 (Cadmium plated external dimensions)
Standard materials	Corrosion-resistant steel inner ring and outer ring
Surface treatment	Inner ring passivated



d	**β**	**E**
in/*mm*	°	in/*mm*
0.1900/ 0.2500 *4,826/* *6,35*	20	0.003 *0,076*
0.3125 *7,937*	30	0.003 *0,076*
0.3750/ 2.0000 *9,525/* *50,8*	30	0.005 *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*							
4,83	03	0.1900 *4,826*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.6250 *15,875*	0/–0.0003 *0/–0,008*	0/-0.0005 *0/-0,013*	0.327 *8,306*	0.437 *11,100*
6,35	04	0.2500 *6,350*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.6250 *15,875*	0/–0.0003 *0/–0,008*	0/-0.0005 *0/-0,013*	0.327 *8,306*	0.437 *11,100*
7,94	05	0.3125 *7,937*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.6875 *17,462*	0/–0.0003 *0/–0,008*	0/-0.0005 *0/-0,013*	0.317 *8,052*	0.437 *11,100*
9,52	06	0.3750 *9,525*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.8125 *20,637*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.405 *10,287*	0.500 *12,700*
11,11	07	0.4375 *11,112*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.9375 *23,812*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.442 *11,227*	0.562 *14,275*
11,11..DS	07A	0.4375 *11,112*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	0.9062 *23,017*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.442 *11,227*	0.562 *14,275*
12,7	08	0.5000 *12,700*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.0000 *25,400*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.505 *12,827*	0.625 *15,875*
14,29	09	0.5625 *14,288*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.1250 *28,575*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.536 *13,614*	0.687 *17,450*

Dimensions cont.

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** d_1 ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,200*	P 0/–0.010 *0/–0,250*	R	α	**Mass** ≈
–		in/*mm*						°	lb/*g*
4,83	03	0.300 *7,62*	0.010 *0,254*	0.015 *0,381*	0.563 *14,300*	0.025 *0,640*	0.0050/0.0100 *0,127/0,254*	16	0.03 *13*
6,35	04	0.300 *7,62*	0.010 *0,254*	0.015 *0,381*	0.563 *14,300*	0.025 *0,640*	0.0050/0.0100 *0,127/0,254*	16	0.03 *12*
7,94	05	0.360 *9,14*	0.010 *0,254*	0.015 *0,381*	0.625 *15,875*	0.025 *0,640*	0.0050/0.0100 *0,127/0,254*	16	0.03 *13*
9,52	06	0.466 *11,84*	0.010 *0,254*	0.015 *0,381*	0.712 *18,085*	0.035 *0,890*	0.0100/0.0170 0.254/0.432	10	0.05 *23*
11,11	07	0.537 *13,64*	0.010 *0,254*	0.020 *0,508*	0.837 *21,260*	0.035 *0,890*	0.0100/0.0170 0.254/0.432	11	0.07 *33*
11,11..DS	07A	0.537 *13,64*	0.010 *0,254*	–	0.808 *20,520*	0.035 *0,890*	0.0100/0.0170 0.254/0.432	11	0.07 *30*
12,7	08	0.607 *15,42*	0.010 *0,254*	0.020 *0,508*	0.900 *22,860*	0.035 *0,890*	0.0100/0.0170 0.254/0.432	10	0.09 *40*
14,29	09	0.721 *18,31*	0.010 *0,254*	0.020 *0,508*	1.025 *26,035*	0.035 *0,890*	0.0100/0.0170 0.254/0.432	11	0.12 *56*

Designation system

Examples: ZENLS12,7RXTT-2CP6RP01
ENLC11,11RDSPPCP109

Z ENL S 12,7 R X TT -2 CP6 RP01

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Lubrication grooves

No code	Without lubrication groove
S	Lubrication by inner ring
C4)	Lubrication by outer ring
Y1)	Lubrication by inner and outer ring

Bore code

Chamfer and groove

No code2)	Chamfered outer ring
R	Grooved outer ring

Clearances

No code	Standard clearances
X	Reduced clearances

Shield and seal

No code	No shield and seal
TT1) 5)	Sealed
PP1) 5)	shielded

Lubricant

No code	Grease G354
–2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP61)	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP553)	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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1) SKF option
2) SKF option for bore code 11,11DS
3) Available only for inner ring in corrosion-resistant steel material
4) No groove in the outer ring sphere for d ≤ 7,94
5) Only available for d ≥ 7,94

Loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Static limit loads Radial C_s	Axial C_a5)	Standard clearances Radial	Axial max	Reduced clearances Radial	Axial max
–		lbf/*kN*		in/*µm*			
4,83	**03**	12 150 *54*	5 175 *23*	0.0004/0.0012 *10/30*	0.0047 *120*	0.0001/0.0004 *2/10*	0.0014 *35*
6,35	**04**	13 725 *61*	5 850 *26*	0.0004/0.0012 *10/30*	0.0047 *120*	0.0001/0.0004 *2/10*	0.0014 *35*
7,94	**05**	14 175 *63*	5 400 *24*	0.0004/0.0012 *10/30*	0.0047 *120*	0.0001/0.0004 *2/10*	0.0014 *35*
9,52	**06**	21 375 *95*	8 325 *37*	0.0004/0.0012 *10/30*	0.0047 *120*	0.0001/0.0004 *2/10*	0.0014 *35*
11,11	**07**	27 000 *120*	10 575 *47*	0.0004/0.0012 *10/30*	0.0047 *120*	0.0001/0.0004 *2/10*	0.0014 *35*
11,11..DS	**07A**	27 000 *120*	10 575 *47*	0.0004/0.0012 *10/30*	0.0047 *120*	0.0001/0.0004 *2/10*	0.0014 *35*
12,7	**08**	35 550 *158*	13 950 *62*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0001/0.0004 *2/10*	0.0014 *35*
14,29	**09**	43 875 *195*	16 200 *72*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0001/0.0005 *3/12*	0.0016 *40*

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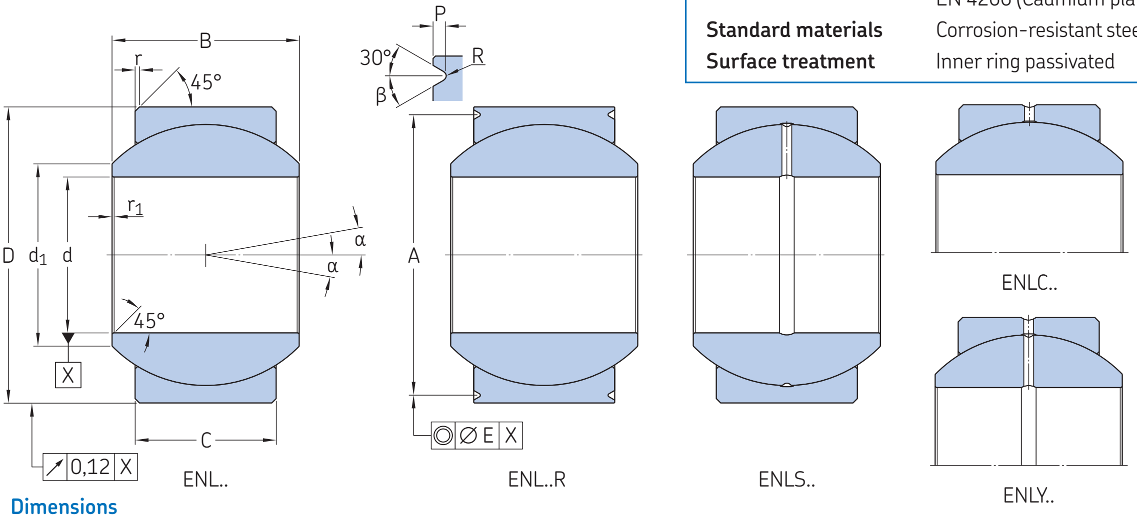
5) These values can be limited by the unstaking load (contact SKF for more information)

2.14 Metal-to-metal swaged wide (inch dimensions)

ENL.. bore code **15,87** to **50,8**

Technical specification	EN 2337
Product standards	EN 4265 (Not plated) EN 4266 (Cadmium plated external dimensions)
Standard materials	Corrosion-resistant steel inner ring and outer ring
Surface treatment	Inner ring passivated



d	β	E
in/*mm*	°	in/*mm*
0.1900/ 0.2500	20	0.003
4,826/ *6,35*		*0,076*
0.3125	30	0.003
7,937		*0,076*
0.3750/ 2.0000	30	0.005
9,525/ *50,8*		*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*							
15,87	**10**	0.6250 *15,875*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.1875 *30,162*	0/–0.0004 *0/–0,009*	0/-0.0005 *0/-0,013*	0.567 *14,400*	0.750 *19,050*
19,05	**12**	0.7500 *19,050*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.3750 *34,925*	0/–0.0004 *0/–0,011*	0/-0.0005 *0/-0,013*	0.630 *16,002*	0.875 *22,225*
22,22	**14**	0.8750 *22,225*	0/–0.005 *0/–0,127*	0/-0.0005 *0/-0,013*	1.6250 *41,275*	0/–0.0004 *0/–0,011*	0/-0.0005 *0/-0,013*	0.755 *19,177*	0.875 *22,225*
25,4	**16**	1.0000 *25,400*	0/–0.005 *0/–0,127*	+0.0001/–0.0006 *+0,003/–0,015*	2.1250 *53,975*	0/–0.0005 *0/–0,013*	+0.0001/–0.0006 *+0,003/–0,015*	1.005 *25,527*	1.375 *34,925*
31,75	**20**	1.2500 *31,750*	0/–0.005 *0/–0,127*	+0.0001/–0.0006 *+0,003/–0,015*	2.3750 *60,325*	0/–0.0005 *0/–0,013*	+0.0001/–0.0006 *+0,003/–0,015*	1.130 *28,700*	1.500 *38,100*
38,10	**24**	1.5000 *38,100*	0/–0.005 *0/–0,127*	+0.0001/–0.0006 *+0,003/–0,015*	2.6875 *68,260*	0/–0.0005 *0/–0,013*	+0.0001/–0.0006 *+0,003/–0,015*	1.223 *31,064*	1.687 *42,850*
44,45	**28**	1.7500 *44,450*	0/–0.005 *0/–0,127*	+0.0001/–0.0006 *+0,003/–0,015*	3.0000 *76,200*	0/–0.0005 *0/–0,013*	+0.0001/–0.0006 *+0,003/–0,015*	1.317 *33,450*	1.812 *46,020*
50,8	**32**	2.0000 *50,800*	0/–0.005 *0/–0,127*	+0.0001/–0.0006 *+0,003/–0,015*	3.2500 *82,550*	0/–0.0005 *0/–0,013*	+0.0001/–0.0006 *+0,003/–0,015*	1.380 *35,050*	1.937 *49,190*

Dimensions cont.

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d_1 ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,200*	P 0/–0.010 *0/–0,250*	R	α	Mass ≈
–		in/*mm*						°	lb/*g*
15,87	**10**	0.747 *18,97*	0.010 *0,254*	0.020 *0,508*	1.087 *27,610*	0.035 *0,890*	0.0100/0.0170 0.254/0.432	12	0.14 *63*
19,05	**12**	0.845 *21,46*	0.010 *0,254*	0.030 *0,762*	1.251 *31,775*	0.055 *1,400*	0.0100/0.0170 0.254/0.432	14	0.20 *92*
22,22	**14**	0.995 *25,27*	0.010 *0,254*	0.030 *0,762*	1.501 *38,125*	0.055 *1,400*	0.0100/0.0170 0.254/0.432	6	0.32 *146*
25,4	**16**	1.269 *32,23*	0.010 *0,254*	0.030 *0,762*	2.001 *50,825*	0.055 *1,400*	0.0100/0.0170 0.254/0.432	15	0.86 *392*
31,75	**20**	1.462 *37,15*	0.010 *0,254*	0.030 *0,762*	2.251 *57,180*	0.055 *1,400*	0.0100/0.0170 0.254/0.432	13	1.10 *499*
38,10	**24**	1.697 *43,10*	0.010 *0,254*	0.030 *0,762*	2.563 *65,100*	0.055 *1,400*	0.0100/0.0170 0.254/0.432	14	1.47 *668*
44,45	**28**	1.965 *49,90*	0.010 *0,254*	0.030 *0,762*	2.876 *73,050*	0.055 *1,400*	0.0100/0.0170 0.254/0.432	13	1.89 *859*
50,8	**32**	2.209 *56,10*	0.010 *0,254*	0.030 *0,762*	3.124 *79,350*	0.055 *1,400*	0.0100/0.0170 0.254/0.432	13	2.22 *1 005*

Designation system

Examples: ZENLS12,7RXTT-2CP6RP01
ENLC11,11RDSPPCP109

Z | ENL | S | 12,7 | R | X | TT | -2 | CP6 | RP01

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Lubrication grooves

No code	Without lubrication groove
S	Lubrication by inner ring
C4)	Lubrication by outer ring
Y1)	Lubrication by inner and outer ring

Bore code

Chamfer and groove

No code2)	Chamfered outer ring
R	Grooved outer ring

Clearances

No code	Standard clearances
X	Reduced clearances

Shield and seal

No code	No shield and seal
TT1) 5)	Sealed
PP1) 5)	shielded

Lubricant

No code	Grease G354
–2	Grease G395

Surface treatment of inner ring

No code	Not plated
CP61)	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP553)	Passivated corrosion-resistant steel inner ring

Oversize

No code	Standard outer diameter size
RP011)	0.010 in/0,254 mm oversized outer diameter
RP021)	0.020 in/0,508 mm oversized outer diameter

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1) SKF option
2) SKF option for bore code 11,11DS
3) Available only for inner ring in corrosion-resistant steel material
4) No groove in the outer ring sphere for d ≤ 7,94
5) Only available for d ≥ 7,94

Loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Static limit loads Radial C_s	Axial C_a5)	Standard clearances Radial	Axial max	Reduced clearances Radial	Axial max
–		lbf/*kN*		in/*µm*			
15,87	**10**	49 500 *220*	17 775 *79*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0001/0.0005 *3/12*	0.0016 *40*
19,05	**12**	64 125 *285*	20 925 *93*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0001/0.0005 *3/12*	0.0016 *40*
22,22	**14**	83 250 *370*	31 725 *141*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0015/0.0006 *4/15*	0.0020 *50*
25,4	**16**	158 625 *705*	59 625 *265*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0015/0.0006 *4/15*	0.0020 *50*
31,75	**20**	200 250 *890*	76 500 *340*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0015/0.0006 *4/15*	0.0020 *50*
38,10	**24**	247 500 *1 100*	92 250 *410*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0015/0.0006 *4/15*	0.0020 *50*
44,45	**28**	299 250 *1 330*	108 000 *480*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0015/0.0006 *4/15*	0.0020 *50*
50,8	**32**	344 250 *1 530*	117 000 *520*	0.0004/0.0020 *10/50*	0.0090 *229*	0.0002/0.0008 *5/20*	0.0024 *60*

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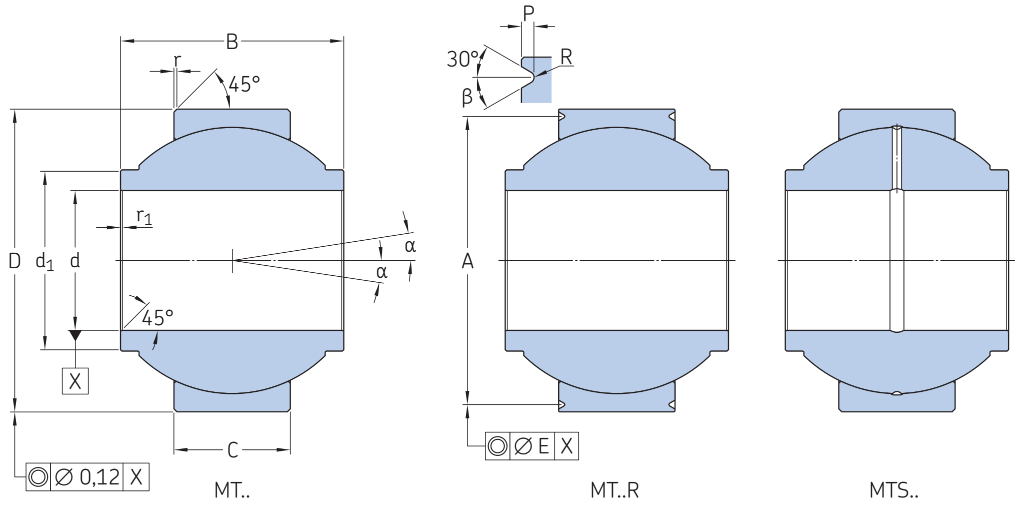
5) These values can be limited by the unstaking load (contact SKF for more information)

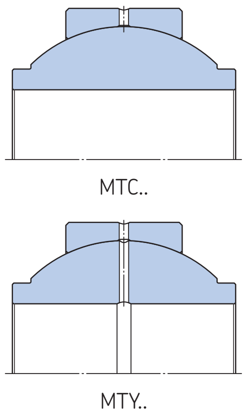
2.15 Metal-to-metal swaged high misalignment (inch dimensions)

MT.. bore code **4,83** to **12,7**

Technical specification	–
Product standards	–

d	β	E
in/*mm*	°	in/*mm*
0.1900/0.4375 *4,826/11,112*	20	0.005 *0,127*
0.5000/1.2500 *12,7/31,75*	30	0.005 *0,127*





Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	d_1 ≈	r_1 +0.012/–0 *+0,230/–0*	r +0.015/0 *+0,381/–0*	A +0.010/0 *+0,254/0*	P 0/–0.254 *0/–0,010*
–		in/*mm*								
4,83	**03**	0.1900 *4,826*	0.5625 *14,288*	0.205 *5,207*	0.500 *12,700*	0.315 *8,000*	0.004 *0,100*	0.020 *0,508*	0.502 *12,751*	0.030 *0,762*
6,35	**04**	0.2500 *6,350*	0.7400 *18,796*	0.250 *6,350*	0.593 *15,062*	0.386 *9,800*	0.004 *0,100*	0.020 *0,508*	0.669 *17,000*	0.030 *0,762*
7,94	**05**	0.3125 *7,938*	0.9060 *23,012*	0.340 *8,636*	0.813 *20,650*	0.512 *13,000*	0.004 *0,100*	0.020 *0,508*	0.831 *21,100*	0.030 *0,762*
9,52	**06**	0.3750 *9,525*	0.9060 *23,012*	0.340 *8,636*	0.813 *20,650*	0.532 *13,500*	0.004 *0,100*	0.020 *0,508*	0.831 *21,100*	0.030 *0,762*
11,11	**07**	0.4375 *11,112*	1.0000 *25,400*	0.340 *8,636*	0.875 *22,225*	0.620 *15,750*	0.004 *0,100*	0.020 *0,508*	0.925 *23,500*	0.030 *0,762*
12,7	**08**	0.5000 *12,700*	1.1250 *28,575*	0.396 *10,058*	0.937 *23,799*	0.728 *18,480*	0.004 *0,100*	0.020 *0,508*	1.047 *26,600*	0.030 *0,762*

Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions R	α	Mass ≈	Static limit loads Radial C_s	 Axial C_a[1]	Axial clearance Reduced	 Standard
–		in/*mm*	°	lb/*g*	lbf/*kN*		in/*µm*	
4,83	**03**	0.005/0.010 *0.127/0.254*	15	0.02 *9*	3 642 *16,2*	899 *4,0*	0.0002/0.0020 *5/50*	0.0020/0.0040 *50/100*
6,35	**04**	0.005/0.010 *0.127/0.254*	24	0.04 *18*	6 924 *30,8*	517 *2,3*	0.0002/0.0020 *5/50*	0.0020/0.0040 *50/100*
7,94	**05**	0.005/0.010 *0.127/0.254*	23	0.07 *32*	12 544 *55,8*	1 304 *5,8*	0.0002/0.0020 *5/50*	0.0020/0.0040 *50/100*
9,52	**06**	0.005/0.010 *0.127/0.254*	22	0.07 *32*	12 544 *55,8*	1 304 *5,8*	0.0002/0.0020 *5/50*	0.0020/0.0040 *50/100*
11,11	**07**	0.005/0.010 *0.127/0.254*	22	0.10 *45*	13 286 *59,1*	1 394 *6,2*	0.0002/0.0020 *5/50*	0.0020/0.0040 *50/100*
12,7	**08**	0.005/0.010 *0.127/0.254*	20	0.16 *73*	18 906 *84,1*	2 360 *10,5*	0.0002/0.0020 *5/50*	0.0020/0.0040 *50/100*

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[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMTS12,7RXTT-2CP6RP01
QMT25,4PPCP109

Z WQ MT S 12,7 R X TT -2 CP6 RP01

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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

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[2]	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

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[2] Available only for inner ring in corrosion-resistant steel material

[3] No groove in the outer ring sphere for d ≤ 7,94

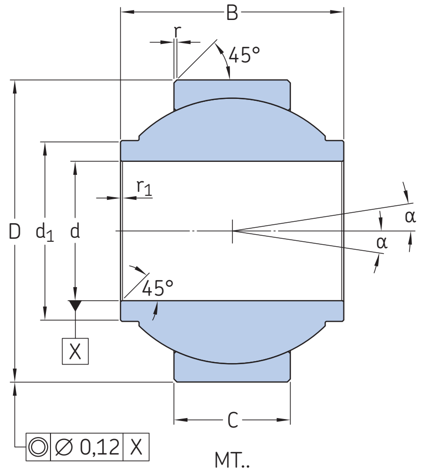
[4] Only available for d ≥ 7,94

2.15 Metal-to-metal swaged high misalignment (inch dimensions)

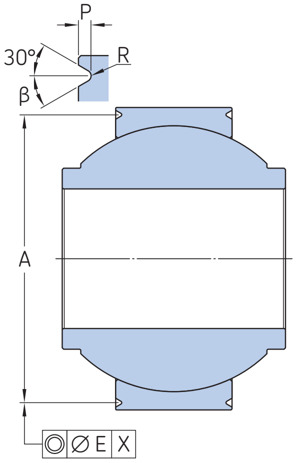
MT.. bore code **15,87** to **31,75**

Technical specification	–
Product standards	–

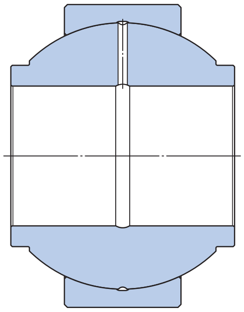
d	β	E
in/*mm*	°	in/*mm*
0.1900/0.4375 *4,826/11,112*	20	0.005 *0,127*
0.5000/1.2500 *12,7/31,75*	30	0.005 *0,127*



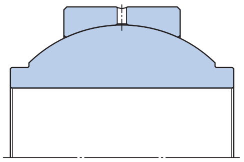
MT..



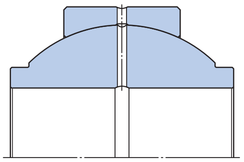
MT..R



MTS..



MTC..



MTY..

Dimensions

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	d_1 ≈	r_1 +0.012/–0 *+0,230/–0*	r +0.015/0 *+0,381/–0*	A +0.010/0 *+0,254/0*	P 0/–0.254 *0/–0,010*
–		in/*mm*								
15,87	**10**	0.6250 *15,875*	1.3750 *34,925*	0.562 *14,275*	1.200 *30,480*	0.857 *21,770*	0.004 *0,100*	0.020 *0,508*	1.268 *32,200*	0.040 *1,016*
19,05	**12**	0.7500 *19,050*	1.5625 *39,688*	0.615 *15,621*	1.280 *32,512*	0.963 *24,450*	0.004 *0,100*	0.020 *0,508*	1.437 *36,500*	0.060 *1,524*
22,22	**14**	0.8750 *22,225*	1.7500 *44,450*	0.620 *15,748*	1.400 *35,560*	1.122 *28,490*	0.004 *0,100*	0.020 *0,508*	1.624 *41,250*	0.060 *1,524*
25,4	**16**	1.0000 *25,400*	2.1250 *53,975*	0.830 *21,082*	1.875 *47,625*	1.272 *32,320*	0.004 *0,100*	0.020 *0,508*	2.003 *50,876*	0.060 *1,524*
31,75	**20**	1.2500 *31,750*	2.5000 *63,500*	1.000 *25,400*	1.875 *47,625*	1.523 *38,700*	0.004 *0,100*	0.020 *0,508*	2.370 *60,200*	0.060 *1,524*

Dimensions cont., loads and clearance

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** R	α	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a1)	**Axial clearance** Reduced	Standard
–		in/*mm*	°	lb/*g*	lbf/*kN*		in/*µm*	
15,87	**10**	0.010/0.020 *0.254/0.508*	20	0.25 *114*	34 080 *151,6*	5 553 *24,7*	0.0002/0.0020 *5/50*	0.0020/0.0040 *50/100*
19,05	**12**	0.010/0.020 *0.254/0.508*	19	0.32 *145*	51 457 *228,9*	6 362 *28,3*	0.0002/0.0020 *5/50*	0.0020/0.0040 *50/100*
22,22	**14**	0.010/0.020 *0.254/0.508*	19	0.43 *195*	61 708 *274,5*	6 452 *28,7*	0.0002/0.0024 *5/60*	0.0024/0.0047 *60/120*
25,4	**16**	0.010/0.020 *0.254/0.508*	21	0.81 *367*	84 053 *373,9*	12 206 *54,3*	0.0002/0.0024 *5/60*	0.0024/0.0047 *60/120*
31,75	**20**	0.010/0.020 *0.254/0.508*	21	1.11 *504*	119 301 *530,7*	19 355 *86,1*	0.0002/0.0024 *5/60*	0.0024/0.0047 *60/120*

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1) These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZWQMTS12,7RXTT-2CP6RP01
QMT25,4PPCP109

Z	WQ	MT	S	12,7	R	X	TT	-2	CP6	RP01

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[3]	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[4]	Sealed
PP[4]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

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[2]	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

---

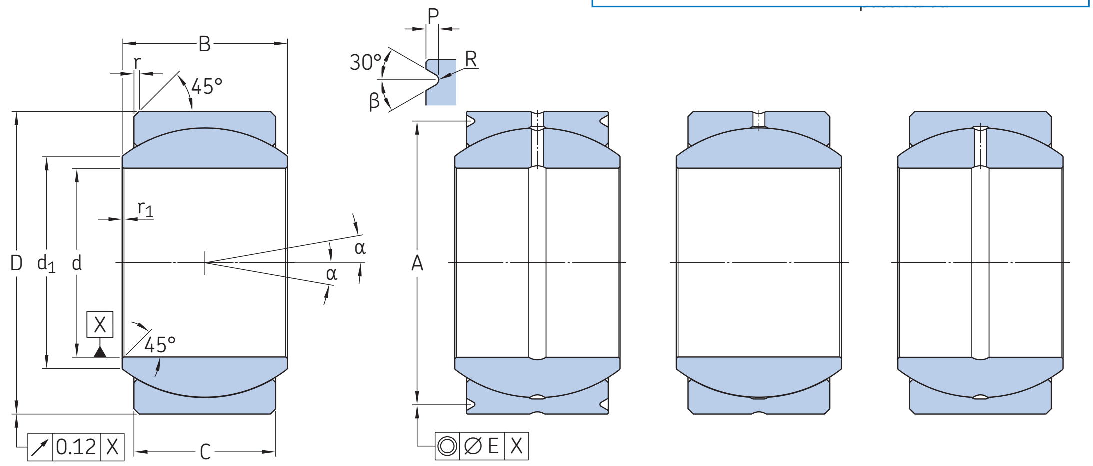
[2] Available only for inner ring in corrosion-resistant steel material
[3] No groove in the outer ring sphere for d ≤ 7,94
[4] Only available for d ≥ 7,94

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 *6,35*	20	0.005 *0,127*
≥ 0.3125 ≥ *7,937*	30	0.005 *0,127*



QXMBY..R   QXMBC..   QXMBS..

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.005 *0/–0,127*	B 0/–0.005 *0/–0,127*	d_1 ≈	r_1 +0.010/–0 *+0,254/–0*	r +0.020/–0 *+0,508/–0*	A +0/–0.010 *+0/–0,254*	P 0/–0.015 *0/–0,380*
–		in/*mm*								
6,35	04	0.2500 *6,350*	0.6562 *16,667*	0.250 *6,350*	0.343 *8,712*	0.357 *9,068*	0.005 *0,127*	0.010 *0,254*	0.596 *15,138*	0.030 *0,762*
7,94	05	0.3125 *7,937*	0.7500 *19,050*	0.281 *7,137*	0.375 *9,525*	0.413 *10,490*	0.005 *0,127*	0.010 *0,254*	0.652 *16,561*	0.040 *1,016*
9,52	06	0.3750 *9,525*	0.8125 *20,637*	0.312 *7,925*	0.406 *10,312*	0.509 *12,923*	0.005 *0,127*	0.010 *0,254*	0.714 *18,136*	0.040 *1,016*
11,11	07	0.4375 *11,112*	0.9062 *23,017*	0.343 *8,712*	0.437 *11,100*	0.563 *14,300*	0.005 *0,127*	0.010 *0,254*	0.808 *20,523*	0.040 *1,016*
12,7	08	0.5000 *12,700*	1.0000 *25,400*	0.390 *9,906*	0.500 *12,700*	0.634 *16,104*	0.005 *0,127*	0.010 *0,254*	0.878 *22,301*	0.060 *1,524*
14,29	09	0.5625 *14,288*	1.0937 *27,780*	0.437 *11,100*	0.562 *14,275*	0.664 *16,866*	0.005 *0,127*	0.010 *0,254*	0.972 *24,689*	0.060 *1,524*
15,87	10	0.6250 *15,875*	1.1875 *30,162*	0.500 *12,700*	0.625 *15,875*	0.732 *18,593*	0.005 *0,127*	0.010 *0,254*	1.065 *27,051*	0.060 *1,524*
19,05	12	0.7500 *19,050*	1.4375 *36,512*	0.593 *15,062*	0.750 *19,050*	0.913 *23,190*	0.005 *0,127*	0.010 *0,254*	1.315 *33,401*	0.060 *1,524*

Designation system

Examples:	ZQXMBC12,7RTTCP6RP01 QXMB25,4PPCP109

Z QXMB C 12,7 R TT CP6 RP01

Surface treatment of outer ring

No code	Not plated
Z1)	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Lubrication grooves

No code1)	Without lubrication groove
S1)	Lubrication by inner ring
C3)	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
TT1), 4)	Sealed
PP1), 4)	Shielded

Surface treatment of inner ring

No code	Not plated
CP61)	Chromium plated sphere
CP1091)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP552)	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

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1) SKF option
2) SKF option, available only for inner ring in corrosion-resistant steel material
3) No groove in the outer ring sphere for d ≤ 7,94
4) Only available for d ≥ 7,94

Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions R	α	Mass ≈	Static limit loads Radial C_s	Axial1) C_a	Dynamic loads Mode I2)	Mode II3)	Clearances max Radial	Axial
–		in/*mm*	°	lb/*g*	lbf/*kN*				in/*μm*	
6,35	**04**	0.005/0.010 *0,127/0,254*	12	0.03 *14*	6 330 *28,17*	1 930 *8,59*	2 570 *11,43*	5 000 *22,24*	0.001 *25*	0.005 *127*
7,94	**05**	0.010/0.020 *0,127/0,254*	11	0.04 *18*	8 460 *37,65*	2 450 *10,90*	3 520 *15,66*	6 300 *28,02*	0.001 *25*	0.005 *127*
9,52	**06**	0.010/0.020 *0,254/0,508*	9	0.05 *22*	11 400 *50,73*	3 090 *13,75*	4 570 *20,33*	8 200 *36,48*	0.001 *25*	0.005 *127*
11,11	**07**	0.010/0.020 *0,254/0,508*	8	0.06 *27*	14 800 *65,86*	3 740 *16,64*	5 750 *25,58*	9 900 *44,04*	0.001 *25*	0.005 *127*
12,7	**08**	0.010/0.020 *0,254/0,508*	8	0.08 *36*	20 400 *90,78*	4 860 *21,63*	7 500 *33,36*	12 650 *56,27*	0.001 *25*	0.005 *127*
14,29	**09**	0.010/0.020 *0,254/0,508*	8	0.11 *50*	26 700 *118,81*	6 100 *27,14*	9 500 *42,26*	15 300 *68,06*	0.001 *25*	0.005 *127*
15,87	**10**	0.010/0.020 *0,254/0,508*	8	0.14 *64*	33 100 *147,30*	8 080 *35,96*	11 750 *52,27*	19 300 *85,85*	0.001 *25*	0.005 *127*
19,05	**12**	0.010/0.020 *0,254/0,508*	8	0.24 *109*	50 000 *222,50*	11 440 *50,91*	16 900 *75,17*	28 200 *125,44*	0.001 *25*	0.005 *127*

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1) These values can be limited by the unstaking load (contact SKF for more information)
2) Load fixed with respect to the outer ring 3) Load fixed with respect to the inner ring

2.16 Metal-to-metal swaged (inch dimensions)

QXMB.. bore code **20,64** to **38,10**

Technical specification AS 81936

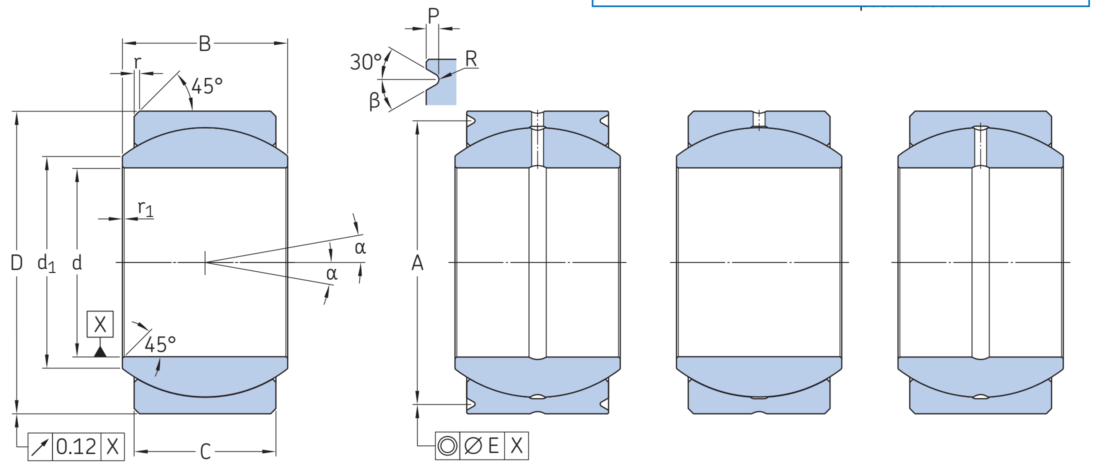
Product standards
AS 81936/1 (Grooved outer ring)
AS 81936/2 (Chamfered outer ring)

Materials

Inner ring:	Bronze beryllium
External ring:	Corrosion-resistant steel

Lubricant Grease G395

d	β	E
in/*mm*	°	in/*mm*
0.2500 *6,35*	20	0.005 *0,127*
≥ 0.3125 ≥ *7,937*	30	0.005 *0,127*



QXMBY..R QXMBC.. QXMBS..

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.005 *0/–0,127*	B 0/–0.005 *0/–0,127*	d1 ≈	r1 +0.010/–0 *+0,254/–0*	r +0.020/–0 *+0,508/–0*	A +0/–0.010 *+0/–0,254*	P 0/–0.015 *0/–0,380*
–		in/*mm*								
20,64	**13**	0.8125 *20,638*	1.5625 *39,688*	0.650 *16,510*	0.812 *20,625*	0.984 *24,994*	0.005 *0,127*	0.010 *0,254*	1.440 *36,576*	0.060 *1,524*
22,22	**14**	0.8750 *22,225*	1.6562 *42,067*	0.703 *17,856*	0.875 *22,225*	1.054 *26,772*	0.005 *0,127*	0.010 *0,254*	1.534 *38,964*	0.060 *1,524*
25,4	**16**	1.0000 *25,400*	1.8750 *47,625*	0.797 *20,244*	1.000 *25,400*	1.193 *30,302*	0.005 *0,127*	0.010 *0,254*	1.753 *44,653*	0.060 *1,524*
28,57	**18**	1.1250 *28,575*	2.1250 *53,975*	0.900 *22,860*	1.125 *28,575*	1.334 *33,884*	0.005 *0,127*	0.010 *0,254*	2.003 *50,876*	0.060 *1,524*
31,75	**20**	1.2500 *31,750*	2.3125 *58,737*	1.000 *25,400*	1.250 *31,750*	1.473 *37,414*	0.005 *0,127*	0.010 *0,254*	2.190 *55,626*	0.060 *1,524*
34,92	**22**	1.3750 *34,925*	2.5625 *65,088*	1.100 *27,940*	1.375 *34,925*	1.654 *42,012*	0.005 *0,127*	0.010 *0,254*	2.440 *61,976*	0.060 *1,524*
38,10	**24**	1.5000 *38,100*	2.8125 *71,437*	1.200 *1,223*	1.500 *38,100*	1.794 *45,568*	0.005 *0,127*	0.010 *0,254*	2.690 *68,326*	0.060 *1,524*

Designation system

Examples: ZQXMBC12,7RTTCP6RP01
QXMB25,4PPCP109

Z QXMB C 12,7 R TT CP6 RP01

Surface treatment of outer ring

No code	Not plated
Z[1]	Cadmium plated external dimensions
SZ[1]	Zinc-nickel plated external dimensions

Basic designation

Lubrication grooves

No code[1]	Without lubrication groove
S[1]	Lubrication by inner ring
C[3]	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[1), 4)]	Sealed
PP[1), 4)]	Shielded

Surface treatment of inner ring

No code	Not plated
CP6[1]	Chromium plated sphere
CP109[1]	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55[2]	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

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[1] SKF option
[2] SKF option, available only for inner ring in corrosion-resistant steel material
[3] No groove in the outer ring sphere for d ≤ 7,94
[4] Only available for d ≥ 7,94

Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions R	α	Mass ≈	Static limit loads Radial C_s	Axial[1] C_a	Dynamic loads Mode I[2]	Mode II[3]	Clearances max Radial	Axial
–		in/mm	°	lb/g	lbf/kN				in/µm	
20,64	13	0.010/0.020 *0,254/0,508*	8	0.28 *127*	59000.00 *262,45*	13 800 *61,39*	19 800 *88,07*	33 400 *148,57*	0.001 *25*	0.005 *127*
22,22	14	0.010/0.020 *0,254/0,508*	8	0.37 *168*	70 300 *312,84*	16 160 *71,91*	23 000 *102,31*	38 700 *172,15*	0.001 *25*	0.005 *127*
25,4	16	0.010/0.020 *0,254/0,508*	8	0.53 *240*	77 700 *345,76*	20 850 *92,78*	30 000 *133,45*	49 800 *221,52*	0.001 *25*	0.005 *127*
28,57	18	0.010/0.020 *0,254/0,508*	8	0.71 *321*	121 500 *540,46*	26 740 *118,95*	38 000 *169,03*	63 000 *280,24*	0.001 *25*	0.005 *127*
31,75	20	0.010/0.020 *0,254/0,508*	8	1.00 *454*	152 000 *676,40*	33 065 *147,14*	46 900 *208,62*	77 500 *344,74*	0.001 *25*	0.005 *127*
34,92	22	0.010/0.020 *0,254/0,508*	8	1.26 *570*	186000.00 *827,37*	40 120 *178,46*	56 900 *253,10*	95 000 *422,58*	0.001 *25*	0.005 *127*
38,10	24	0.010/0.020 *0,254/0,508*	8	1.79 *812*	224 000 *996,80*	47 820 *212,80*	67 500 *300,25*	112 500 *500,42*	0.001 *25*	0.005 *127*

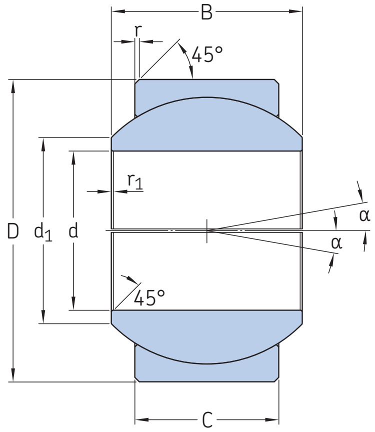
[1] These values can be limited by the unstaking load (contact SKF for more information)
[2] Load fixed with respect to the outer ring [3] Load fixed with respect to the inner ring

2.17 Metal-to-metal split (inch dimensions)

2PL.. bore code **4,83** to **15,87**

Technical specification –

Product standards –



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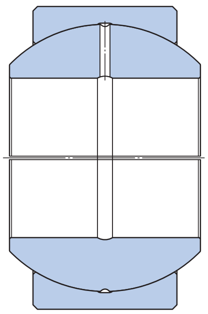

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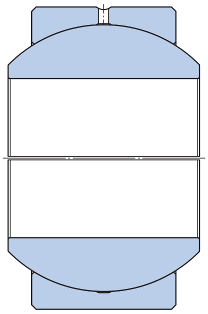
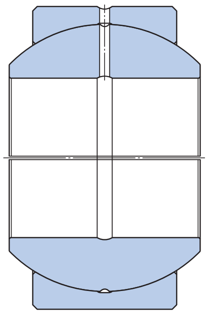


2PLC..



2PLY..

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_1 ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	α
–		in/*mm*							°
4,83	**03**	0.1900 *4,826*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.300 *7,620*	0.010 *0,254*	0.015 *0,381*	15
6,35	**04**	0.2500 *6,350*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.300 *7,620*	0.010 *0,254*	0.015 *0,381*	15
7,94	**05**	0.3125 *7,937*	0.6875 *17,462*	0.317 *8,052*	0.437 *11,100*	0.360 *9,140*	0.010 *0,254*	0.015 *0,381*	14
9,52	**06**	0.3750 *9,525*	0.8125 *20,637*	0.406 *10,312*	0.500 *12,700*	0.466 *11,840*	0.010 *0,254*	0.020 *0,508*	8
11,11	**07**	0.4375 *11,112*	0.9375 *23,812*	0.442 *11,227*	0.562 *14,275*	0.537 *13,640*	0.010 *0,254*	0.020 *0,508*	10
12,7	**08**	0.5000 *12,700*	1.0000 *25,400*	0.505 *12,827*	0.625 *15,875*	0.607 *15,420*	0.010 *0,254*	0.020 *0,508*	9
14,29	**09**	0.5625 *14,288*	1.1250 *28,575*	0.536 *13,614*	0.687 *17,450*	0.721 *18,310*	0.010 *0,254*	0.020 *0,508*	10
15,87	**10**	0.6250 *15,875*	1.1875 *30,162*	0.567 *14,400*	0.750 *19,050*	0.747 *18,970*	0.010 *0,254*	0.020 *0,508*	12

Loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Mass ≈	Static limit loads Radial C_s	 Axial C_a	Clearance Radial
–		lb/*g*	lbf/*kN*		in/*µm*
4,83	**03**	0.03 *14*	12 150 *54*	5 175 *23*	0.0004/0.0008 *10/20*
6,35	**04**	0.03 *14*	13 725 *61*	5 850 *26*	0.0004/0.0008 *10/20*
7,94	**05**	0.035 *16*	14 175 *63*	5 400 *24*	0.0004/0.0008 *10/20*
9,52	**06**	0.06 *27*	21 375 *95*	8 325 *37*	0.0004/0.0008 *10/20*
11,11	**07**	0.08 *38*	27 000 *120*	10 575 *47*	0.0004/0.0008 *10/20*
12,7	**08**	0.10 *45*	35 550 *158*	13 950 *62*	0.0004/0.0008 *10/20*
14,29	**09**	0.14 *61*	43 875 *195*	16 200 *72*	0.0004/0.0012 *10/30*
15,87	**10**	0.16 *73*	49 500 *220*	17 775 *79*	0.0004/0.0012 *10/30*

Designation system

Examples:	ZW2PLS12,7TT-2CP6RP01 Q2PLC25,4PPCP109	

Z W 2PL S 12,7 TT -2 CP6 RP01

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[2)]	Lubrication by outer ring
Y	Lubrication by inner and outer ring

Bore code

Shield and seal

No code	No shield and seal
TT[3)]	Sealed
PP[3)]	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

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[1)]	Passivated corrosion-resistant steel inner ring

Oversize

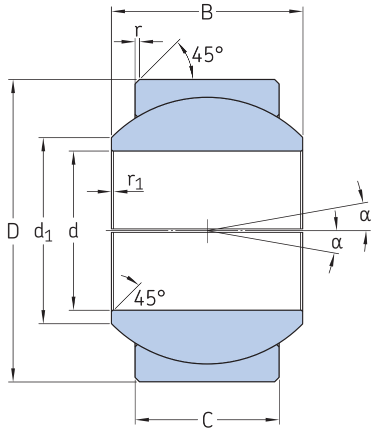
No code	Standard outer diameter size
RP01	0.010 in/0,254 mm oversized outer diameter
RP02	0.020 in/0,508 mm oversized outer diameter

[1)] Available only for inner ring in corrosion-resistant steel material
[2)] No groove in the outer ring sphere for d ≤ 7,94
[3)] Only available for d ≥ 7,94

2.17 Metal-to-metal split (inch dimensions)

2PL.. bore code **19,05** to **50,80**

Technical specification	–
Product standards	–



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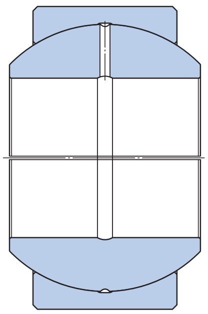
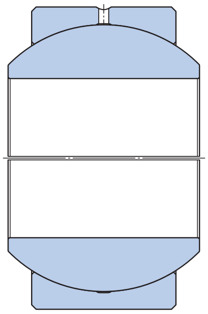
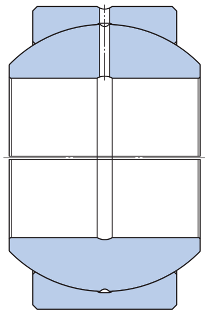


2PLS..



2PLC..



2PLY..

Dimensions

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_1 ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	α
–		in/*mm*							°
19,05	**12**	0.7500 *19,050*	1.3750 *34,925*	0.630 *16,002*	0.875 *22,225*	0.845 *21,460*	0.010 *0,254*	0.030 *0,762*	13
22,22	**14**	0.8750 *22,225*	1.6250 *41,275*	0.755 *19,177*	0.875 *22,225*	0.995 *25,270*	0.010 *0,254*	0.030 *0,762*	6
25,4	**16**	1.0000 *25,400*	2.1250 *53,975*	1.005 *25,527*	1.375 *34,925*	1.269 *32,230*	0.010 *0,254*	0.030 *0,762*	12
31,75	**20**	1.2500 *31,750*	2.3750 *60,325*	1.130 *28,700*	1.500 *38,100*	1.462 *37,150*	0.010 *0,254*	0.030 *0,762*	12
38,10	**24**	1.5000 *38,100*	2.6875 *68,260*	1.223 *31,064*	1.687 *42,850*	1.697 *43,100*	0.010 *0,254*	0.030 *0,762*	13
44,45	**28**	1.7500 *44,450*	3.0000 *76,200*	1.317 *33,450*	1.812 *46,020*	1.965 *49,900*	0.010 *0,254*	0.030 *0,762*	12
50,80	**32**	2.0000 *50,800*	3.2500 *82,550*	1.380 *35,050*	1.937 *49,190*	2.209 *56,100*	0.010 *0,254*	0.030 *0,762*	12

Loads and clearance

Nominal bore code	**Dash number** multiples of 1/16 inch	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a	**Clearance** Radial
–		lb/*g*	lbf/*kN*		in/*µm*
19,05	**12**	0.24 *109*	64 125 *285*	20 925 *93*	0.0004/0.0012 *10/30*
22,22	**14**	0.35 *159*	83 250 *370*	31 725 *141*	0.0004/0.0012 *10/30*
25,4	**16**	0.97 *440*	158 625 *705*	59 625 *265*	0.0004/0.0016 *10/40*
31,75	**20**	1.10 *500*	200 250 *890*	76 500 *340*	0.0004/0.0016 *10/40*
38,10	**24**	1.54 *700*	247 500 *1 100*	92 250 *410*	0.0004/0.0016 *10/40*
44,45	**28**	1.99 *900*	299 250 *1 330*	108 000 *480*	0.0004/0.0016 *10/40*
50,80	**32**	2.31 *1 050*	344 250 *1 530*	117 000 *520*	0.0004/0.0016 *10/40*

Designation system

Examples: ZW2PLS12,7TT-2CP6RP01
Q2PLC25,4PPCP109

Z W 2PL S 12,7 TT -2 CP6 RP01

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[2)	Lubrication by outer ring
Y	Lubrication by inner and outer ring

Bore code

Shield and seal

No code	No shield and seal
TT[3)	Sealed
PP[3)	Shielded

Lubricant

No code	Grease G354
-2	Grease G395

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[1)	Passivated corrosion-resistant steel inner ring

Oversize

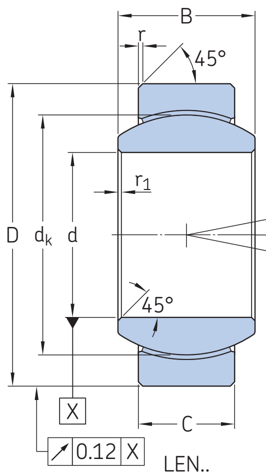
No code	Standard outer diameter size
RP01	0.010 in/0,254 mm oversized outer diameter
RP02	0.020 in/0,508 mm oversized outer diameter

---

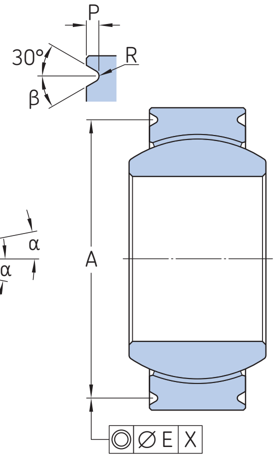
1) Available only for inner ring in corrosion-resistant steel material
2) No groove in the outer ring sphere for d ≤ 7,94
3) Only available for d ≥ 7,94

2.18 Self-lubricating light (metric dimensions)

LEN.. (XRA.. or 11..N..)[2]



LEN..



LEN..R

Technical specification	EN 2755
Product standards	EN 3048 (standard starting torque) EN 4037 (reduced starting torque)
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C
Outer ring	Corrosion-resistant steel 17-4PH

β	E
°	mm
30	0,12

Dimensions

Nominal bore code	Dimensions d Bore without liner	Δdmp	Δds	d_a = d with lined bore H7	D	ΔDmp	ΔDs	C ±0,1	B 0/–0,06	d_k ≈
–	mm	µm		mm		µm		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[1]	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[1]	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[1]	60	0/–12	+3/–15	60	90	0/–13	+10/–23	36	44	80,0
70[1]	70	0/–12	+3/–15	70	105	0/–13	+10/–23	40	49	91,9

Dimensions cont., loads and torque

Nominal bore code	Dimensions r_1 +0,3/0	r	A +0,1/0 Code R	Code PR	P 0/–0,2	R +0,1/0	α	Mass ≈	Static limit loads Radial C_s	Axial C_a[3]	Radial dynamic load C25	Starting torque 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[1]	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[1]	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[1]	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[1]	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)

Cross-reference designation system to XRA.. or 11..N..

Examples: ZLEN17ARXTTFR10
LEN15/26PPD

Z LEN 17 A R X TT F R10

Surface treatment of outer ring

No code	Not plated
Z[1]	Cadmium plated external dimensions
SZ[1]	Zinc-nickel plated external dimensions

Basic designation

Bore code

Lined bore

No code	Bore without liner
A[1]	Lined bore

Chamfer and groove

No code	Chamfered outer ring
R and PR[2]	Grooved outer ring

Starting torque

No code	Standard
X	Reduced

Shield and seal

No code	No shield and seal
TT[1]	Sealed
PP[1]	Shielded

Surface treatment of inner ring

No code	Not plated
F	Chromium plated sphere
D[1]	XCR plating on sphere (chromium 6 free replacement to chromium plating)
V	Passivated inner ring
K[1] [3]	XLHP coated sphere
N[1] [3]	XLNT coated sphere
H[1] [3]	XL coated sphere

Oversize

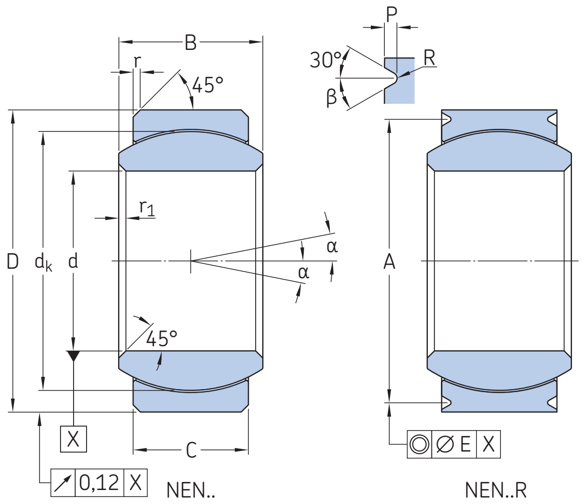
No code	Standard outer diameter size
R10[1]	0,1 mm oversized outer diameter
R20[1]	0,2 mm oversized outer diameter

---

[1] SKF option
[2] Available only for bore codes 15/26, 17/30, 20, 25 and 30
[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

2.19 Self-lubricating narrow (metric dimensions)

NEN.. (XRE.., 11..W.., 11..N.. or 11..E..)[1] bore code **5** to **25**



NEN..

NEN..R

Technical specification	EN 2755
Product standards	EN 2584 (standard starting torque) EN 4038 (reduced starting torque)
Materials	
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 Bore without liner	Δdmp	Δds	d_a = d with lined bore H7	D	ΔDmp	ΔDs	C ±0,1	B 0/–0,06	d_k ≈
–	mm	µm		mm		µm		mm		
5	5	0/–8	+2/–10	5	14	0/–8	+5/–13	5,5	7	11,1
6	6	0/–8	+2/–10	6	16	0/–8	+5/–13	6,5	9	12,7
8	8	0/–8	+2/–10	8	18	0/–8	+5/–13	7	10	14,3
10	10	0/–8	+2/–10	10	21	0/–9	+6/–15	8	10,5	15,9
12	12	0/–8	+3/–11	12	25	0/–9	+6/–15	10	13	19,8
15	15	0/–8	+3/–11	15	29	0/–9	+6/–15	12	15	25,4
17	17	0/–8	+3/–11	17	31	0/–9	+6/–15	13,5	16	27,0
22	22	0/–10	+3/–13	22	40	0/–11	+8/–19	18	22	34,9
25	25	0/–10	+3/–13	25	45	0/–11	+8/–19	20	25	38,7

Dimensions cont., loads and torque

Nominal bore code	Dimensions						Mass	Static limit loads		Radial dynamic load	Starting torque	
	r_1 +0,3/0	r	A +0,1/0	P 0/–0,2	R +0,1/0	α	≈	Radial C_s	Axial C_a[2]	C25	Standard	Reduced
–	mm					°	g	kN			Nm	
5	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
6	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
8	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
10	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
12	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
15	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
17	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
22	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
25	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)

Cross-reference designation system to XRE.., 11..W.., 11..N.. or 11..E..

Examples: ZNEN17ARXTTFR10
NEN6PPD

Z NEN 17 A R X TT F R10

Surface treatment of outer ring

No code	Not plated
Z1)	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Bore code

Lined bore

No code	Bore without liner
A1) 2)	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
TT1) 2)	Sealed
PP1) 2)	Shielded

Surface treatment of inner ring

No code	Not plated
F	Chromium plated sphere
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
V	Passivated inner ring
K1) 3)	XLHP coated sphere
N1) 3)	XLNT coated sphere
H1) 3)	XL coated sphere

Oversize

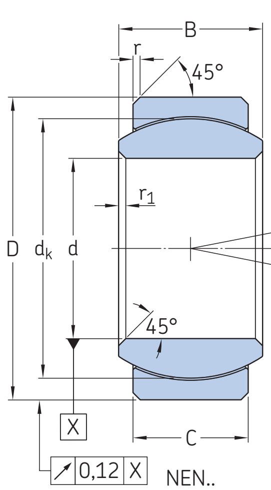
No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

---

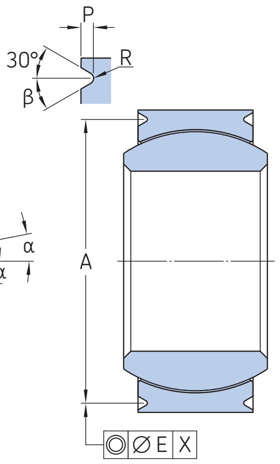
1) SKF option
2) Only available for d ≥ 6
3) For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

2.19 Self-lubricating narrow (metric dimensions)

NEN.. (XRE.., 11..W.., 11..N.. or 11..E..)[1] bore code **30** to **55**



NEN..



NEN..R

Technical specification	EN 2755
Product standards	EN 2584 (standard starting torque) EN 4038 (reduced starting torque)
Materials	
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 Bore without liner	Δdmp	Δds	d_a = d with lined bore H7	D	ΔDmp	ΔDs	C ±0,1	B 0/–0,06	d_k ≈
–	mm	µm		mm		µm		mm		
30	30	0/–10	+3/–13	30	51	0/–13	+10/–23	24	28	45,2
35	35	0/–12	+3/–15	35	57	0/–13	+10/–23	26	31	52,0
40	40	0/–12	+3/–15	40	64	0/–13	+10/–23	29	34	58,0
45	45	0/–12	+3/–15	45	72	0/–13	+10/–23	32	37	64,0
50	50	0/–12	+3/–15	50	80	0/–15	+13/–28	34	41	72,0
55[3]	55	0/–12	+3/–15	55	96	0/–15	+13/–28	40	52	82,0

Dimensions cont., loads and torque

Nominal bore code	**Dimensions** r_1 +0,3/0	r	A +0,1/0	P 0/–0,2	R +0,1/0	α	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[2]	**Radial dynamic load** C25	**Starting torque** Standard	Reduced
–	mm					°	g	kN			Nm	
30	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
35	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
40	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
45	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
50	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
55[1]	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] SKF option

Cross-reference designation system to XRE.., 11..W.., 11..N.. or 11..E..

Examples:	ZNEN17ARXTTFR10 NEN6PPD	Z NEN 17 A R X TT F R10

Surface treatment of outer ring

No code	Not plated
Z1)	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Bore code

Lined bore

No code	Bore without liner
A1) 2)	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
TT1) 2)	Sealed
PP1) 2)	Shielded

Surface treatment of inner ring

No code	Not plated	
F	Chromium plated sphere	
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)	
V	Passivated inner ring	
K1) 3	XLHP coated sphere	9
N1) 3)	XLNT coated sphere	
H1) 3)	XL coated sphere	

Oversize

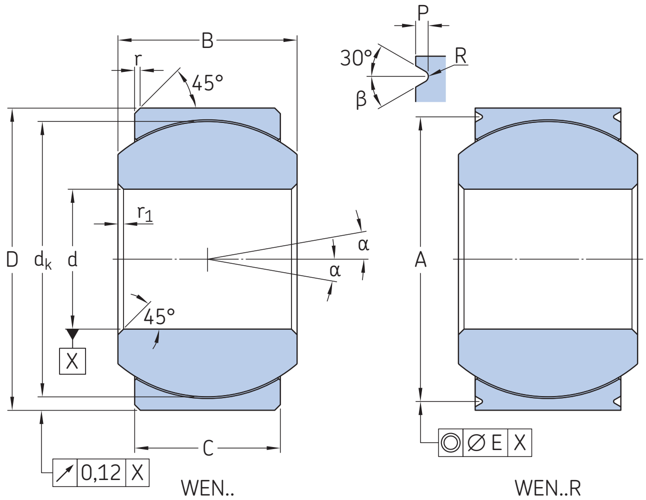
No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

---

1) SKF option
2) Only available for d ≥ 6
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

2.20 Self-lubricating wide (metric dimensions)

WEN.. (XRL.., 11..E.. or 11..W..)[2] bore code **5** to **17**



WEN..

WEN..R

Technical specification	EN 2755
Product standards	EN 2585 (standard starting torque) EN 4039 (reduced starting torque)
Materials	
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 Bore without liner	Δdmp	Δds	d_a = d with lined bore H7	D	ΔDmp	ΔDs	C ±0,1	B 0/–0,06	d_k ≈
–	mm	µm		mm		µm		mm		
5	5	0/–8	+2/–10	5	16	0/–8	+5/–13	8,5	11	13,4
6	6	0/–8	+2/–10	6	16	0/–8	+5/–13	8,5	11	13,4
8	8	0/–8	+2/–10	8	18	0/–8	+5/–13	8	11	15,1
10	10	0/–8	+2/–10	10	21	0/–9	+6/–15	10	12,5	17,5
12	12	0/–8	+3/–11	12	26	0/–9	+6/–15	13	16	22,3
15	15	0/–8	+3/–11	15	29	0/–9	+6/–15	13,5	17	25,4
17	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_1 +0,3/0	r	A +0,1/0	P 0/–0,2	R +0,1/0	α	Mass ≈	Static limit loads Radial C_s	Axial C_a[3]	Radial dynamic load C25	Starting torque Standard	Reduced
–	mm					°	g	kN			Nm	
5	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
6	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
8	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
10	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
12	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
15	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
17	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)

Cross-reference designation system to XRL.., 11..E.. or 11..W..

Examples:	ZWEN17ARXTTFR10 WEN5PPD	Z	WEN	17	A	R	X	TT	F	R10

Surface treatment of outer ring

No code	Not plated
Z1)	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Bore code

Lined bore

No code	Bore without liner
A1) 2)	Lined bore

Chamfer and groove

No code	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
X3)	Reduced

Shield and seal

No code	No shield and seal
TT1) 2)	Sealed
PP1) 2)	Shielded

Surface treatment of inner ring

No code	Not plated
F	Chromium plated sphere
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
V	Passivated inner ring
K1) 4)	XLHP coated sphere
N1) 4)	XLNT coated sphere
H1) 4)	XL coated sphere

Oversize

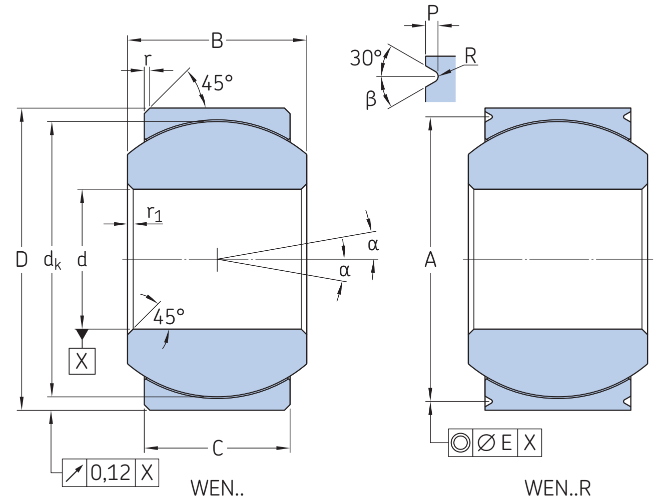
No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

---

1) SKF option
2) Only available for d ≥ 6
3) SKF option for d = 5 and d = 55
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

2.20 Self-lubricating wide (metric dimensions)

WEN.. (XRL.., 11..E.. or 11..W..)[2] bore code **20** to **60**



Technical specification	EN 2755
Product standards	EN 2585 (standard starting torque) EN 4039 (reduced starting torque)
Materials	
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 Bore without liner	Δdmp	Δds	d_a = d with lined bore H7	D	ΔDmp	ΔDs	C ±0,1	B 0/–0,06	d_k ≈
–	mm	µm		mm		µm		mm		
20	20	0/–10	+3/–13	20	35	0/–11	+8/–19	16	20	30,9
25	25	0/–10	+3/–13	25	54	0/–13	+10/–23	26	32	47,6
30	30	0/–10	+3/–13	30	60	0/–13	+10/–23	28	34	53,2
35	35	0/–12	+3/–15	35	65	0/–13	+10/–23	29	36	58,0
40	40	0/–12	+3/–15	40	68	0/–13	+10/–23	31	38	60,4
45	45	0/–12	+3/–15	45	76	0/–13	+10/–23	33	41	67,9
50	50	0/–12	+3/–15	50	82	0/–15	+13/–28	35	44	74,6
55	55	0/–12	+3/–15	55	96	0/–15	+13/–28	40	52	82,0
60[1]	60	0/–12	+3/–15	60	105	0/–15	+13/–28	48	60	92,0

Dimensions cont., loads and torque

Nominal bore code	**Dimensions**						**Mass**	**Static limit loads**		**Radial dynamic load**	**Starting torque**	
	r_1 +0,3/0	r	A +0,1/0	P 0/–0,2	R +0,1/0	α	≈	Radial C_s	Axial C_a[3]	C25	Standard	Reduced
–	mm					°	g	kN			Nm	
20	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
25	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
30	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
35	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
40	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
45	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
50	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
55	0,1	0,8/1,2	92,8	1,5	0,3	10	1 580	1 298,7	221,2	649,3	0,6/2,7	0,03/0,6
60[1]	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)

Cross-reference designation system to XRL.., 11..E.. or 11..W..

Examples: ZWEN17ARXTTFR10
WEN5PPD

Z WEN 17 A R X TT F R10

Surface treatment of outer ring

No code	Not plated
Z1)	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Bore code

Lined bore

No code	Bore without liner
A1) 2)	Lined bore

Chamfer and groove

No code	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
X3)	Reduced

Shield and seal

No code	No shield and seal
TT1) 2)	Sealed
PP1) 2)	Shielded

Surface treatment of inner ring

No code	Not plated
F	Chromium plated sphere
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
V	Passivated inner ring
K1) 4)	XLHP coated sphere
N1) 4)	XLNT coated sphere
H1) 4)	XL coated sphere

Oversize

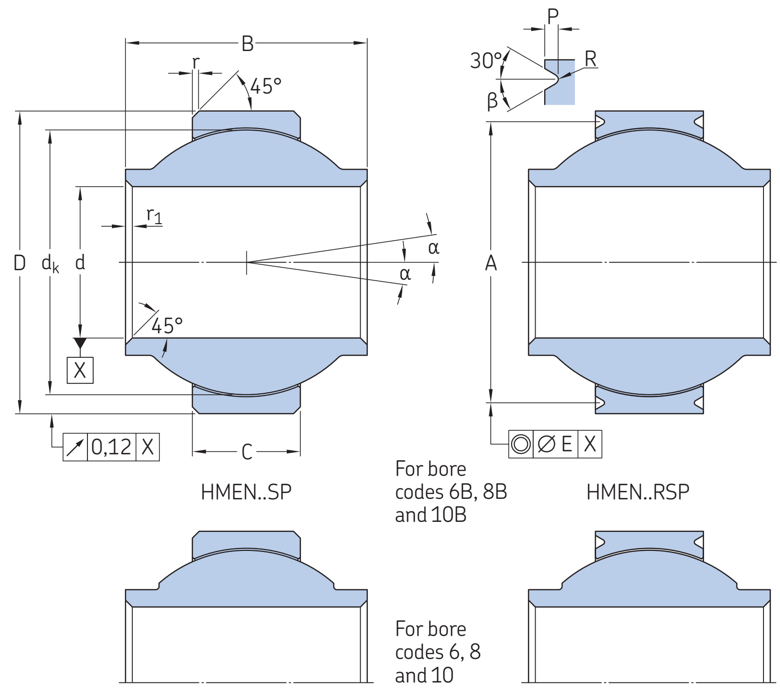
No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

---

1) SKF option
2) Only available for d ≥ 6
3) SKF option for d = 5 and d = 55
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

2.21 Self-lubricating high-misalignment (metric dimensions)

HMEN... (RL..SP.. or 11E..H..)[2]



Technical specification	EN 2755
Product standards	EN 4040
Materials	
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	0,08
10	30	0,12

Dimensions

Nominal bore code	**Dimensions** d Bore without liner	Δdmp	Δds	d_a = d with lined bore H7	D	ΔDmp	ΔDs	C ±0,1	B 0/–0,06	d_k ≈	d_1 ≈
–	mm	µm		mm		µm		mm			
6[1]	6	0/–8	+5/–13	6	18	0/–8	+2/–10	8	14	15,0	9
6B	6	0/–8	+5/–13	6	18	0/–8	+2/–10	8	14	15,0	9
8[1]	8	0/–9	+6/–15	8	21	0/–8	+2/–10	10	15	17,5	11
8B	8	0/–9	+6/–15	8	21	0/–8	+2/–10	10	15	17,5	11
10[1]	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

Dimensions cont., loads and torque

Nominal bore code	**Dimensions** r_1 +0,5/0	r + 0,3/0	A +0,1/0	P 0/–0,2	R +0,1/0	α	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[3]	**Radial dynamic load** C25	**Starting torque** Standard	Reduced
–	mm					°	g	kN			Nm	
6[1]	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
6B	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
8[1]	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
8B	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
10[1]	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
10B	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

---

[1] SKF option

[2] Parts are delivered and marked with RL..SP.. or 11E..H.. standard references

[3] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to RL..SP.. or 11E..H..

Examples: ZHMEN6ARXTTFR10
HMEN8PPD

Z HMEN 6 A R X TT F R10

Surface treatment of outer ring

No code	Not plated
Z1)	Cadmium plated external dimensions
SZ1)	Zinc-nickel plated external dimensions

Basic designation

Bore code

Lined bore

No code	Bore without liner
A1) 2)	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
TT1) 2)	Sealed
PP1) 2)	Shielded

Surface treatment of inner ring

No code	Not plated
F1)	Chromium plated sphere
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
V	Passivated inner ring
K1) 3)	XLHP coated sphere
N1) 3)	XLNT coated sphere
H1) 3)	XL coated sphere

Oversize

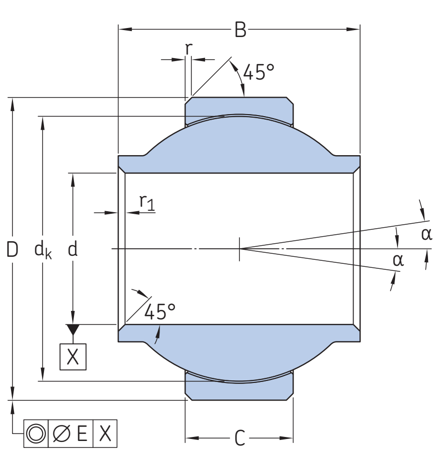
No code	Standard outer diameter size
R101)	0,1 mm oversized outer diameter
R201)	0,2 mm oversized outer diameter

---

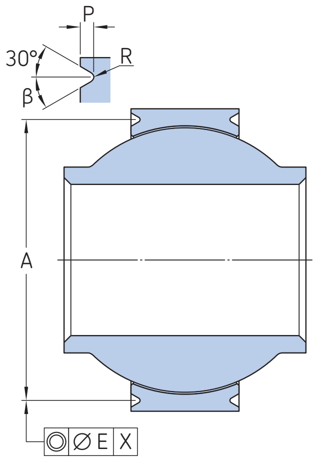
1) SKF option
2) Only available for d ≥ 6
3) For sealed (code TT) or shielded (code PP) bearings with XLHP, XLNT or XL coated sphere, contact SKF to check for availability and technical suitability

2.22 Self-lubricating high misalignment (metric dimensions)

XRT...



XRT



XRT..R

Technical specification	EN 2755
Product standards	SKF
Materials	
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 Bore without liner	Δdmp	d_a = d with lined bore H7	D	ΔDmp	C ±0,1	B 0/–0,06	d_k ≈	d_1 ≈
–	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						Mass	Static limit loads		Radial dynamic load	Starting torque	
	r_1 +0,3/0	r +0,3/0	A +0,15/0	P 0/–0,2	R +0,1/0	α	≈	Radial C_s	Axial C_a[1]	C25	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

---

[1] These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZXRT17ARXTTCP6R10
XRT5PPCP109

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
A1)	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
TT1)	Sealed
PP1)	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

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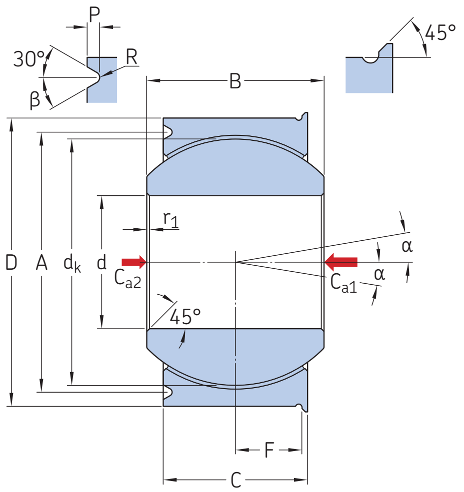
1) Only available for d ≥ 6

2.23 Self-lubricating (metric dimensions)

XRL..FR



XRL..FR

Technical specification	EN 2755
Product standards	SKF
Materials	
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** d Bore without liner	Δdmp	d_a = d with lined bore H7	D	ΔDmp	C ±0,1	B 0/–0,06	d_k ≈
–	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** r_1 +0,3/0	F +0,1/0	A +0,1/0	P 0/–0,2	R +0,1/0	α	**Mass** ≈	**Static limit loads** Axial C_{a1}	Axial C_{a2}	Radial C_s	**Radial dynamic load** C25	**Starting torque** 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

Designation system

Examples: ZXRL17FRARXTTCP6R10
XRL5FRPPCP109

Z XRL 17 FR 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[1]	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[1]	Sealed
PP[1]	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

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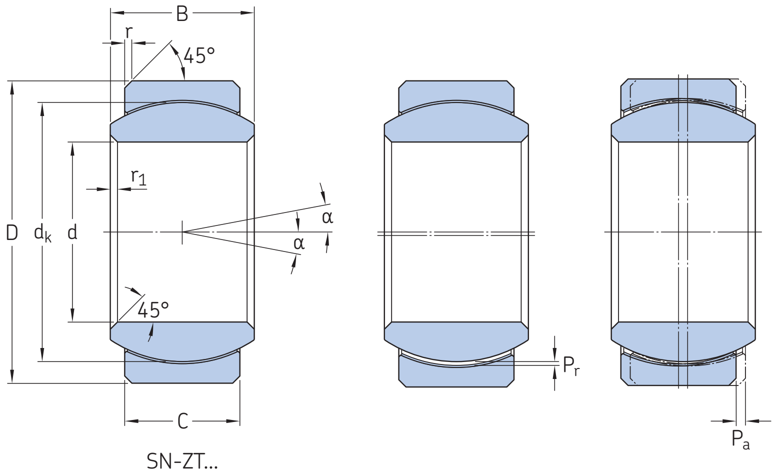
1) Only available for d ≥ 6

2.24 Self-lubricating narrow controlled clearance (inch dimensions)

SN..ZT...



SN-ZT...

Technical specification	AS 81820
Product standards	SKF
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C
Outer ring	Corrosion-resistant steel 17-4PH

Dimensions

Nominal bore code	**Size**	**Dimensions** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.010 *0/–0,254*	B 0/–0.002 *0/–0,051*	d_k ≈	r 0/–0.010 *0/–0,254*	r_1 +0.010/0 *+0,254/0*	α
–		in/*mm*							°
03	3/16	0.1900 *4,8260*	0.5625 *14,2875*	0.223 *5,664*	0.281 *7,137*	0.437 *11,100*	0.020 *0,508*	0.005 *0,127*	10
04	1/4	0.2500 *6,3500*	0.6562 *16,6675*	0.255 *6,477*	0.343 *8,712*	0.500 *12,700*	0.020 *0,508*	0.005 *0,127*	12
05	5/16	0.3125 *7,9375*	0.7500 *19,0500*	0.286 *7,264*	0.375 *9,525*	0.593 *15,062*	0.025 *0,635*	0.005 *0,127*	11
06	3/8	0.3750 *9,5250*	0.8125 *20,6375*	0.317 *8,052*	0.406 *10,312*	0.625 *15,875*	0.025 *0,635*	0.005 *0,127*	10
08	1/2	0.5000 *12,7000*	1.0000 *25,4000*	0.395 *10,033*	0.500 *12,700*	0.781 *19,837*	0.030 *0,762*	0.005 *0,127*	9°30'
10	5/8	0.6250 *15,8750*	1.1875 *30,1625*	0.505 *12,827*	0.625 *15,875*	1.000 *25,400*	0.030 *0,762*	0.005 *0,127*	8°30'
12	3/4	0.7500 *19,0500*	1.4375 *36,5125*	0.598 *15,189*	0.750 *19,050*	1.250 *31,750*	0.030 *0,762*	0.005 *0,127*	8°30'
14	7/8	0.8750 *22,2250*	1.5625 *39,6875*	0.708 *17,983*	0.875 *22,225*	1.375 *34,925*	0.040 *1,016*	0.005 *0,127*	9
16	1	1.0000 *25,4000*	1.7500 *44,4500*	0.802 *20,371*	1.000 *25,400*	1.562 *39,675*	0.040 *1,016*	0.005 *0,127*	9°30'

Designation system

Examples: SN04ZTCY2
SN12ZT

SN 04 ZT C Y2

Basic designation — SN ZT

Bore code (multiples of 1/16 inch) — 04

Surface treatment of outer ring — C

No code	Not plated
C	Cadmium plated external dimensions
J	Zinc-nickel plated external dimensions

Oversize — Y2

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** ≈	**Static limit loads** Radial C_s	Axial C_a1)	**No load dynamic torque** max	**Clearances** Radial max	Axial max
–		lb/*g*	lbf/*kN*		lbf-in/*Nm*	in/*mm*	
03	**3/16**	0.02 *9,1*	4 270 *18,99*	500 *2,22*	0.06 *0,007*	0.0010 *0,0254*	0.0035 *0,0889*
04	**1/4**	0.02 *9,1*	5 910 *26,29*	750 *3,34*	0.06 *0,007*	0.0010 *0,0254*	0.0035 *0,0889*
05	**5/16**	0.03 *13,6*	8 110 *36,08*	1 000 *4,45*	0.06 *0,007*	0.0010 *0,0254*	0.0035 *0,0889*
06	**3/8**	0.04 *18,1*	9 714 *43,21*	1 400 *6,23*	0.08 *0,009*	0.0012 *0,0305*	0.0040 *0,1016*
08	**1/2**	0.07 *31,8*	16 360 *72,77*	2 700 *12,01*	0.08 *0,009*	0.0012 *0,0305*	0.0040 *0,1016*
10	**5/8**	0.12 *54,4*	27 540 *122,50*	4 750 *21,13*	0.12 *0,014*	0.0015 *0,0381*	0.0045 *0,1143*
12	**3/4**	0.21 *95,3*	41 400 *184,16*	6 900 *30,69*	0.12 *0,014*	0.0015 *0,0381*	0.0045 *0,1143*
14	**7/8**	0.27 *122,5*	*50 990* *226,81*	7 900 *35,14*	0.18 *0,020*	*0.0018* *0,0457*	*0.0055* *0,1397*
16	**1**	0.39 *176,9*	66 730 *296,83*	10 700 *47,60*	0.25 *0,028*	0.0020 *0,0508*	0.0060 *0,1524*

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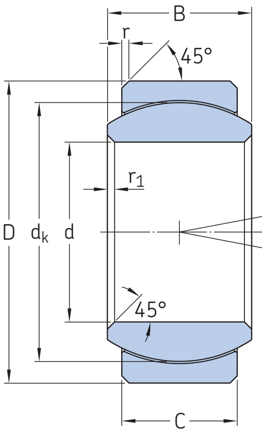
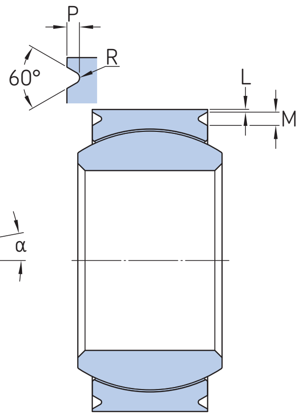
1) These values can be limited by the unstaking load (contact SKF for more information)

2.25 Self-lubricating narrow (inch dimensions)

SN... bore code **03** to **10**



SN...Z



SN...G

Technical specification	AS 8942
Product standards	NSA 8134 (chamfered outer ring) NSA 8136 (grooved outer ring)
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C
Outer ring	Corrosion-resistant steel 17-4PH

Nominal bore code	**L** +0.010/0 *+0,254/0*	**M** +0.010/0 *+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**									
		d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.010 *0/–0,254*	B 0/–0.002 *0/–0,051*	d_k ≈	r 0/–0.010 *0/–0,254*	r_1 +0.010/0 *+0,254/0*	P +0.015/0 *+0,381/0*	R +0.010/0 *+0,254/0*	α
–		in/*mm*									°
03	3/16	0.1900 *4,8260*	0.5625 *14,2875*	0.223 *5,664*	0.281 *7,137*	0.437 *11,100*	0.020 *0,508*	0.005 *0,127*	0.015 *0,381*	0.005 *0,127*	10
04	1/4	0.2500 *6,3500*	0.6562 *16,6675*	0.255 *6,477*	0.343 *8,712*	0.500 *12,703*	0.020 *0,508*	0.005 *0,127*	0.015 *0,381*	0.005 *0,127*	12
05	5/16	0.3125 *7,9375*	0.7500 *19,0500*	0.286 *7,264*	0.375 *9,525*	0.593 *15,062*	0.025 *0,635*	0.005 *0,127*	0.025 *0,635*	0.005 *0,127*	11
06	3/8	0.3750 *9,5250*	0.8125 *20,6375*	0.317 *8,052*	0.406 *10,312*	0.625 *15,875*	0.030 *0,762*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	10
07	7/16	0.4375 *11,1125*	0.9062 *23,0175*	0.348 *8,839*	0.437 *11,100*	0.687 *17,450*	0.030 *0,762*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	9
08	1/2	0.5000 *12,7000*	1.0000 *25,4000*	0.395 *10,033*	0.500 *12,700*	0.781 *19,837*	0.030 *0,762*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	9°30'
09	9/16	0.5625 *14,2875*	1.0937 *27,7800*	0.442 *11,227*	0.562 *14,275*	0.875 *22,225*	0.030 *0,762*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	10
10	5/8	0.6250 *15,8750*	1.1875 *30,1625*	0.505 *12,827*	0.625 *15,875*	1.000 *25,400*	0.030 *0,762*	0.005 *0,127*	*0.045* *1,143*	*0.010* *0,254*	8°30'

Designation system

Examples: SN04GXCY2
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
X2)	Reduced

Surface treatment of outer ring

No code	Not plated
C1)	Cadmium plated external dimensions
J1)	Zinc-nickel plated external dimensions

Oversize

No code	Standard outer diameter size
Y11)	0.005 in/0,127 mm oversized outer diameter
Y21)	0.010 in/0,254 mm oversized outer diameter
Y31)	0.015 in/0,381 mm oversized outer diameter
Y41)	0.020 in/0,508 mm oversized outer diameter

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1) SKF option
2) Available only for bore code ≤ 16

Loads and torques

Nominal bore code	**Size**	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a4)	**Radial dynamic load** C25	**Starting torque** Standard	Reduced starting torque3) Max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*	
03	3/16	0.02 *9,1*	3 975 *17,68*	500 *2,22*	1 500 *6,67*	0.5/3 *0,06/0,34*	0.5 *0,06*
04	1/4	0.02 *9,1*	6 040 *26,87*	750 *3,34*	2 320 *10,32*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
05	5/16	0.03 *13,6*	8 750 *38,92*	1 000 *4,45*	3 430 *15,25*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
06	3/8	0.04 *18,1*	10 540 *46,88*	1 400 *6,23*	4 200 *18,68*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
07	7/16	0.05 *22,7*	13 200 *58,72*	1 800 *8,01*	5 700 *25,35*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
08	1/2	0.07 *31,8*	17 900 *79,62*	2 700 *12,01*	7 900 *35,14*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
09	9/16	0.09 *40,8*	23 200 *103,20*	3 680 *16,37*	10 300 *45,81*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
10	5/8	0.12 *54,4*	*30 500* *135,67*	4 750 *21,13*	13 400 *59,6*	*1.0/5.0* *0,11/0,56*	*1.0* *0,11*

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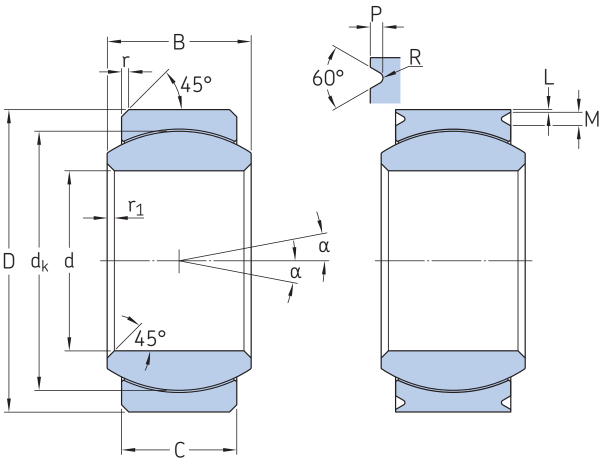
3) The minimum starting torque is limited by zero radial and axial internal clearance
4) These values can be limited by the unstaking load (contact SKF for more information)

2.25 Self-lubricating narrow (inch dimensions)

SN... bore code **12** to **32**



SN...Z SN...G

Technical specification	AS 8942
Product standards	NSA 8134 (chamfered outer ring) NSA 8136 (grooved outer ring)
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C
Outer ring	Corrosion-resistant steel 17-4PH

Nominal bore code	**L** +0.010/0 *+0,254/0*	**M** +0.010/0 *+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** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.010 *0/–0,254*	B 0/–0.002 *0/–0,051*	d_k ≈	r 0/–0.010 *0/–0,254*	r_1 +0.010/0 *+0,254/0*	P +0.015/0 *+0,381/0*	R 0/0.010 *0/0,254*	α
–		in/*mm*									°
12	**3/4**	0.7500 *19,0500*	1.4375 *36,5125*	0.598 *15,189*	0.750 *19,050*	1.250 *31,750*	0.030 *0,762*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	8°30'
14	**7/8**	0.8750 *22,2250*	1.5625 *39,6875*	0.708 *17,983*	0.875 *22,225*	1.375 *34,925*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	9
16	**1**	1.0000 *25,4000*	1.7500 *44,4500*	0.802 *20,371*	1.000 *25,400*	1.562 *39,675*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	9°30'
20	**1 1/4**	1.2500 *31,7500*	2.0000 *50,8000*	0.947 *24,054*	1.093 *27,762*	1.812 *46,020*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	6
24[1]	**1 1/2**	1.5000 *38,1000*	2.4375 *61,9125*	1.135 *28,829*	1.312 *33,325*	2.250 *57,150*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	6
28[1]	**1 3/4**	1.7500 *44,4500*	2.8125 *71,4375*	1.322 *33,579*	1.531 *38,887*	2.625 *66,675*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	6
28PR	**1 3/4**	1.7500 *44,4500*	2.8750 *73,0250*	1.000 *25,400*	1.125 *28,575*	2.592 *65,834*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	4
32[1]	**2**	2.0000 *50,8000*	3.1875 *80,9625*	1.510 *38,354*	1.750 *44,450*	3.000 *76,200*	0.040 *1,016*	0.005 *0,127*	*0.045* *1,143*	*0.010* *0,254*	6

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[1] SKF option

Designation system

Examples: SN04GXCY2
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[2]	Reduced

Surface treatment of outer ring

No code	Not plated
C[1]	Cadmium plated external dimensions
J[1]	Zinc-nickel plated external dimensions

Oversize

No code	Standard outer diameter size
Y1[1]	0.005 in/0,127 mm oversized outer diameter
Y2[1]	0.010 in/0,254 mm oversized outer diameter
Y3[1]	0.015 in/0,381 mm oversized outer diameter
Y4[1]	0.020 in/0,508 mm oversized outer diameter

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[1] SKF option
[2] Available only for bore code ≤ 16

Loads and torques

Nominal bore code	**Size**	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[4]	**Radial dynamic load** C25	**Starting torque** Standard	Reduced starting torque[3] Max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*	
12	**3/4**	0.21 *95,3*	46 400 *206,40*	6 749 *30,02*	19 700 *87,63*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
14	**7/8**	0.27 *122,5*	62 200 *276,68*	9 350 *41,59*	26 100 *116,09*	2.0/8.0 *0,23/0,90*	2.0 *0,23*
16	**1**	0.39 *176,9*	82 200 *365,64*	12 160 *54,09*	34 100 *151,68*	2.0/8.0 *0,23/0,90*	2.0 *0,23*
20	**1 1/4**	0.53 *240,4*	93 180 *414,49*	17 535 *78,00*	45 022 *200,27*	3.5/13.3 *0,4/1,5*	– –
24[1]	**1 1/2**	0.96 *435,4*	141 060 *627,47*	24 000 *106,76*	71.607 *318,52*	3.5/13.3 *0,4/1,5*	– –
28[1]	**1 3/4**	1.48 *671,3*	194 040 *863,13*	33 750 *150,13*	72.406 *318,08*	3.5/13.3 *0,4/1,5*	– –
28PR	**1 3/4**	1.20 *545,0*	286 478 *1 274,32*	19 906 *88,55*	65 120 *289,67*	3.5/13.3 *0,4/1,5*	– –
32[1]	**2**	2.10 *952,5*	*255 600* *1 136,97*	44 500 *197,95*	129.751 *577,16*	*3.5/13.3* *0,4/1,5*	– –

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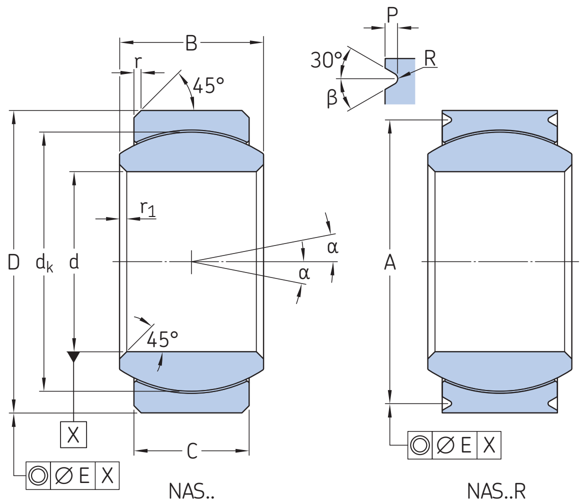
[3] The minimum starting torque is limited by zero radial and axial internal clearance
[4] These values can be limited by the unstaking load (contact SKF for more information)

2.26 Self-lubricating narrow (inch dimensions)

NAS.. (XRE.., 11HN.. or 11BN..)[1] bore code **3** to **10**



Technical specification	AS 81820
Product standards	AS 14101 (grooved outer ring) AS 14104 (chamfered outer ring)
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C or PH13.8
Outer ring	Corrosion-resistant steel 17-4PH

Nominal bore code	**β**	**E**
-	°	in/*mm*
≤ 4	20	0.005/*0,127*
≥ 5	30	0.005/*0,127*

Dimensions

Nominal bore code	**Size**	**Dimensions** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	r_1 max	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,2*	P 0/–0.010 *0/–0,254*	R	α
–		in/*mm*										°
3	**3/16**	0.1900 *4,826*	0.5625 *14,288*	0.218 *5,537*	0.281 *7,137*	0.406 *10,312*	0.010 *0,254*	0.010 *0,254*	0.500 *12,700*	0.025 *0,635*	0.005/0.010 *0,127/0,254*	10
4	**1/4**	0.2500 *6,350*	0.6562 *16,667*	0.250 *6,350*	0.343 *8,712*	0.500 *12,704*	0.010 *0,254*	0.010 *0,254*	0.594 *15,088*	0.025 *0,635*	0.005/0.010 *0,127/0,254*	10
5	**5/16**	0.3125 *7,937*	0.7500 *19,050*	0.281 *7,137*	0.375 *9,525*	0.562 *14,283*	0.010 *0,254*	0.010 *0,254*	0.660 *16,764*	0.035 *0,889*	0.005/0.010 *0,127/0,254*	10
6	**3/8**	0.3750 *9,525*	0.8125 *20,637*	0.312 *7,925*	0.406 *10,312*	0.625 *15,872*	0.010 *0,254*	0.020 *0,508*	0.712 *18,085*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	9
7	**7/16**	0.4375 *11,112*	0.9062 *23,017*	0.343 *8,712*	0.437 *11,100*	0.687 *17,448*	0.010 *0,254*	0.020 *0,508*	0.806 *20,472*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	8
8	**1/2**	0.5000 *12,700*	1.0000 *25,400*	0.390 *9,906*	0.500 *12,700*	0.781 *19,838*	0.010 *0,254*	0.020 *0,508*	0.876 *22,250*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8
9	**9/16**	0.5625 *14,288*	1.0937 *27,780*	0.437 *11,100*	0.562 *14,275*	0.874 *22,212*	0.010 *0,254*	0.020 *0,508*	0.970 *24,638*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8
10	**5/8**	*0.6250* *15,875*	*1.1875* *30,162*	*0.500* *12,700*	*0.625* *15,875*	*0.968* *24,584*	*0.010* *0,254*	*0.020* *0,508*	*1.063* *27,000*	*0.055* *1,397*	*0.010/0.017* *0,254/0,432*	8

Loads and torque

Nominal bore code	**Size**	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[2]	**Radial dynamic loads** C25	**Starting torque** Standard	Standard, SKF precision	Reduced[3] max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*		
3	**3/16**	0.02 *9*	3 975 *17,69*	150 *0,67*	1 500 *6,67*	0.25/5 *0,03/0,56*	0.5/3 *0,06/0,34*	0.5 *0,06*
4	**1/4**	0.02 *9*	6 040 *26,88*	430 *1,91*	3 320 *14,77*	0.25/5 *0,03/0,56*	1/5 *0,11/0,56*	0.5 *0,06*
5	**5/16**	0.03 *14*	8 750 *38,94*	700 *3,11*	5 460 *24,30*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
6	**3/8**	0.04 *18*	10 540 *46,90*	1 100 *4,89*	6 600 *29,37*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
7	**7/16**	0.05 *22*	13 200 *58,74*	1 400 *6,23*	8 050 *35,82*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
8	**1/2**	0.07 *31*	17 900 *79,65*	2 100 *9,34*	10 400 *46,28*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
9	**9/16**	0.09 *40*	23 200 *103,24*	3 680 *16,38*	13 000 *57,85*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
10	**5/8**	0.12 *54*	*30 500* *135,72*	4 720 *21,00*	16 450 *73,20*	*0.25/8* *0,03/0,90*	*1/5* *0,11/0,56*	*1* *0,11*

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[1] Parts are delivered and marked with SKF standard XRE.., 11HN.. (inner ring spherical surface coated) or 11BN.. references.

[2] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to XRE.., 11HN.. or 11BN..

Examples: ZNAS12RXTTFY2 NAS 3PPD	Z	E	NAS	12	R	X	TT	F	Y2

Surface treatment of outer ring

No code	Not plated
SZ	Zinc-nickel plated external dimensions
Z	Cadmium plated external dimensions

Inner ring material

No code	440C
E	PH13.8

Basic designation

Bore code (multiples of 1/16 inch)

Chamfer and groove

No code	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
XS1)	Standard, SKF precision
X	Reduced

Shield and seal

No code	No shield and seal
TT2)	Sealed
PP2)	Shielded

Material and surface treatment of inner ring code

No code	Passivated inner ring
F1)	Chromium plated sphere
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
K1) 3)	XLHP coated sphere
N1) 3)	XLNT coated sphere
H1) 3)	XL coated sphere

Oversize

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

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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

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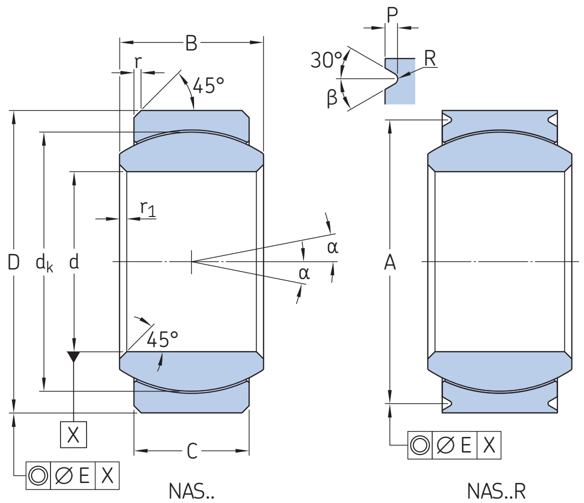
3) If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

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..)[2] bore code **12** to **32**



NAS..

NAS..R

Technical specification	AS 81820
Product standards	AS 14101 (grooved outer ring) AS 14104 (chamfered outer ring)
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C or PH13.8
Outer ring	Corrosion-resistant steel 17-4PH

Nominal bore code	**β**	**E**
–	°	in/*mm*
≤ 4	20	0.005/*0,127*
≥ 5	30	0.005/*0,127*

Dimensions

Nominal bore code	**Size**	**Dimensions** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	r_1 max	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,2*	P 0/–0.010 *0/–0,254*	R	α
–		in/*mm*										°
12	3/4	0.7500 *19,050*	1.4375 *36,512*	0.593 *15,062*	0.750 *19,050*	1.187 *30,149*	0.010 *0,254*	0.030 *0,762*	1.313 *33,350*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8
14	7/8	0.8750 *22,225*	1.5625 *39,688*	0.703 *17,856*	0.875 *22,225*	1.314 *33,370*	0.010 *0,254*	0.030 *0,762*	1.438 *36,525*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8
16	1	1.0000 *25,400*	1.7500 *44,450*	0.797 *20,244*	1.000 *25,400*	1.500 *38,099*	0.010 *0,254*	0.030 *0,762*	1.626 *41,300*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	9
20[1]	1 1/4	1.2500 *31,750*	2.0000 *50,800*	0.937 *23,800*	1.093 *27,762*	1.812 *46,020*	0.010 *0,254*	0.030 *0,762*	1.878 *47,701*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	6
24[1]	1 1/2	1.5000 *38,100*	2.4375 *61,912*	1.135 *28,830*	1.312 *33,320*	2.284 *58,022*	0.010 *0,254*	0.030 *0,762*	2.317 *58,850*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	6
28[1]	1 3/4	1.7500 *44,450*	2.8750 *73,025*	1.000 *25,400*	1.125 *28,575*	2.517 *63,941*	0.010 *0,254*	0.030 *0,762*	2.753 *69,930*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	4
32[1]	2	2.0000 *50,800*	3.1875 *80,963*	1.510 *38,354*	1.750 *44,450*	3.000 *76,200*	0.010 *0,254*	0.040 *1,016*	3.064 *77,826*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	6

Loads and torque

Nominal bore code	**Size**	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[3]	**Radial dynamic load** C25	**Starting torque** Standard	Standard, SKF precision	Reduced[4] max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*		
12	3/4	0.21 *95*	46 400 *206,48*	6 750 *30,03*	23 600 *105,02*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
14	7/8	0.27 *122*	62 200 *276,79*	9 350 *41,60*	30 250 *134,61*	0.25/12 *0,03/1,36*	2/8 *0,23/0,9*	2 *0,23*
16	1	0.39 *176*	82 200 *365,79*	12 160 *54,11*	38 000 *169,10*	0.25/12 *0,03/1,36*	2/8 *0,23/0,9*	2 *0,23*
20[1]	1 1/4	0.53 *240*	91 011 *405,00*	17 528 *78,00*	45 025 *200,27*	2/20 *0,23/2,26*	2.5/13 *0,28/1,47*	2.2 *0,25*
24[1]	1 1/2	0.89 *405*	139 363 *619,39*	26 339 *117,06*	72 410 *322,08*	2/20 *0,23/2,26*	2.5/15.5 *0,28/1,75*	2.5 *0,28*
28[1]	1 3/4	1.20 *545*	127 432 *567,07*	19 924 *88,55*	65 124 *289,67*	10/35 *1,3/3,9*	4.5/19 *0,5/2,15*	4.5 *0,5*
32[1]	2	2.10 *953*	298 200 *1 326,46*	51 905 *230,88*	144 579 *643,12*	10/35 *1,3/3,9*	10.0/35.0 *1,3/3,9*	4.5 *0,5*

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[1] SKF option [2] Parts are delivered and marked with SKF standard XRE.., 11HN.. (inner ring spherical surface coated) or 11BN.. references.

[3] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to XRE.., 11HN.. or 11BN..

Examples: ZNAS12RXTTFY2
NAS 3PPD

Z E NAS 12 R X TT F Y2

Surface treatment of outer ring

No code	Not plated
SZ	Zinc-nickel plated external dimensions
Z	Cadmium plated external dimensions

Inner ring material

No code	440C
E	PH13.8

Basic designation

Bore code (multiples of 1/16 inch)

Chamfer and groove

No code	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
XS[1]	Standard, SKF precision
X	Reduced

Shield and seal

No code	No shield and seal
TT[2]	Sealed
PP[2]	Shielded

Material and surface treatment of inner ring code

No code	Passivated inner ring
F[1]	Chromium plated sphere
D[1]	XCR plating on sphere (chromium 6 free replacement to chromium plating)
K[1] [3]	XLHP coated sphere
N[1] [3]	XLNT coated sphere
H[1] [3]	XL coated sphere

Oversize

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

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[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

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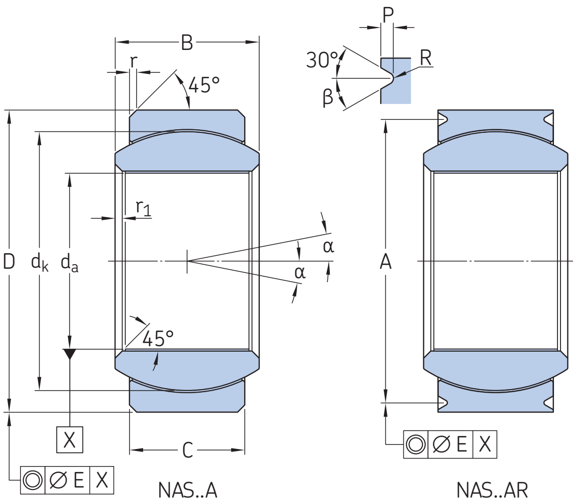
[4] If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

Nominal bore code	**Maximum radial clearance**	**Maximum axial clearance**
-	in/*mm*	
≤ 12	0.0007/*0,0178*	0.0028/*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..)[2] bore code **3** to **9**



Technical specification	AS 81820
Product standards	AS 81820/1 (lined bore and grooved outer ring) AS 81820/4 (lined bore and chamfered outer ring)
Materials	
Liner	X1
Inner ring	Passivated corrosion-resistant steel 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_a 0/–0.0010 *0/–0,0254*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	r_1 max	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,2*	P 0/–0.010 *0/–0,254*	R	α
–		in/*mm*										°
3[1]	3/16	0.1910 *4,851*	0.5625 *14,288*	0.218 *5,537*	0.281 *7,137*	0.406 *10,312*	0.005 *0,127*	0.010 *0,254*	0.500 *12,700*	0.025 *0,635*	0.005/0.010 *0,127/0,254*	10
4	1/4	0.2510 *6,375*	0.6562 *16,667*	0.250 *6,350*	0.343 *8,712*	0.500 *12,704*	0.005 *0,127*	0.010 *0,254*	0.594 *15,088*	0.025 *0,635*	0.005/0.010 *0,127/0,254*	10
5	5/16	0.3135 *7,963*	0.7500 *19,050*	0.281 *7,137*	0.375 *9,525*	0.562 *14,283*	0.005 *0,127*	0.010 *0,254*	0.660 *16,764*	0.035 *0,889*	0.005/0.010 *0,127/0,254*	10
6	3/8	0.3760 *9,550*	0.8125 *20,637*	0.312 *7,925*	0.406 *10,312*	0.625 *15,872*	0.005 *0,127*	0.020 *0,508*	0.712 *18,085*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	9
7	7/16	0.4385 *11,138*	0.9062 *23,017*	0.343 *8,712*	0.437 *11,100*	0.687 *17,448*	0.005 *0,127*	0.020 *0,508*	0.806 *20,472*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	8
8	1/2	0.5010 *12,725*	1.0000 *25,400*	0.390 *9,906*	0.500 *12,700*	0.781 *19,838*	0.005 *0,127*	0.020 *0,508*	0.876 *22,250*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8
9	9/16	0.5635 *14,313*	1.0937 *27,780*	0.437 *11,100*	0.562 *14,275*	0.874 *22,212*	0.005 *0,127*	0.020 *0,508*	0.970 *24,638*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8

Loads and torque

Nominal bore code	Size	Mass ≈	Static limit loads Radial C_s	Axial C_a[3]	Radial dynamic load C25	Starting torque Standard	Standard, SKF precision	Reduced[4] Max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*		
3[1]	3/16	0.02 *9*	3 975 *17,69*	150 *0,67*	1 500 *6,67*	1/5 *0,11/0,56*	1/3 *0,11/0,34*	0.5 *0,06*
4	1/4	0.02 *9*	6 040 *26,88*	430 *1,91*	3 320 *14,77*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	0.5 *0,06*
5	5/16	0.03 *14*	8 750 *38,94*	700 *3,11*	5 460 *24,30*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
6	3/8	0.04 *18*	10 540 *46,90*	1 100 *4,89*	6 600 *29,37*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
7	7/16	0.05 *22*	13 200 *58,74*	1 400 *6,23*	8 050 *35,82*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
8	1/2	0.07 *31*	17 900 *79,65*	2 100 *9,34*	10 400 *46,28*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
9	9/16	0.09 *40*	23 200 *103,24*	3 680 *16,38*	13 000 *57,85*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*

---

[1] SKF option [2] Parts are delivered and marked with SKF standard XRE..A., 11LHN (inner ring spherical surface coated) or 11LBN.. references.

[3] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to XRE..A, 11LHN.. or 11LBN..

Examples: ZNAS12ARXTTFY2
NAS 3APPD

Z E NAS 12 A R X TT F Y2

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Inner ring material

No code	440C
E	PH13.8

Basic designation

Bore code (multiples of 1/16 inch)

Chamfer and groove

No code	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
XS[1]	Standard, SKF precision
X	Reduced

Shield and seal

No code	No shield and seal
TT[2]	Sealed
PP[2]	Shielded

Material and surface treatment of inner ring code

No code	Passivated inner ring
F[1]	Chromium plated sphere
D[1]	XCR plating on sphere (chromium 6 free replacement to chromium plating)
K[1] [3]	XLHP coated sphere
N[1] [3]	XLNT coated sphere
H[1] [3]	XL coated sphere

Oversize

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

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[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

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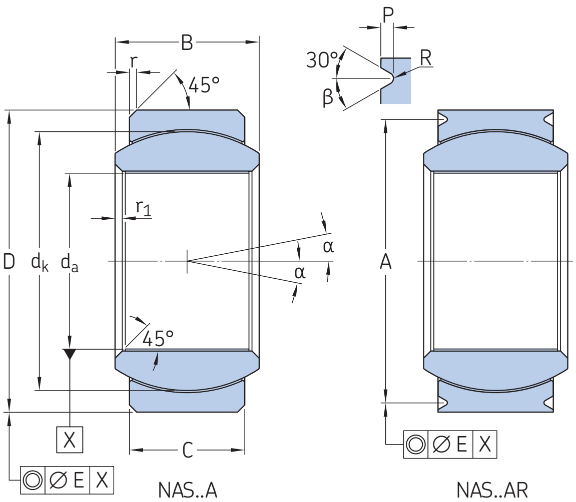
[4] If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

Nominal bore code	Maximum radial clearance	Maximum axial clearance
-	in/*mm*	
≤ 12	0,0007/*0,0178*	0,0028/*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..)[2] bore code **10** to **32**



NAS..A

NAS..AR

Technical specification	AS 81820
Product standards	AS 81820/1 (lined bore and grooved outer ring) AS 81820/4 (lined bore and chamfered outer ring)
Materials	
Liner	X1
Inner ring	Passivated corrosion-resistant steel 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_a 0/–0.0010 *0/–0,0254*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	r_1 max	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,2*	P 0/–0.010 *0/–0,254*	R	α
–		in/*mm*										°
10	**5/8**	0.6260 *15,900*	1.1875 *30,162*	0.500 *12,700*	0.625 *15,875*	0.968 *24,584*	0.005 *0,127*	0.020 *0,508*	1.063 *27,000*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8
12	**3/4**	0.7510 *19,075*	1.4375 *36,512*	0.593 *15,062*	0.750 *19,050*	1.187 *30,149*	0.005 *0,127*	0.030 *0,762*	1.313 *33,350*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8
14	**7/8**	0.8760 *22,250*	1.5625 *39,688*	0.703 *17,856*	0.875 *22,225*	1.314 *33,370*	0.005 *0,127*	0.030 *0,762*	1.438 *36,525*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	8
16	**1**	1.0010 *25,425*	1.7500 *44,450*	0.797 *20,244*	1.000 *25,400*	1.500 *38,099*	0.005 *0,127*	0.030 *0,762*	1.626 *41,300*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	9
20[1]	**1 1/4**	1.2510 *31,775*	2.0000 *50,800*	0.937 *23,800*	1.093 *27,762*	1.812 *46,020*	0.005 *0,127*	0.030 *0,762*	1.878 *47,701*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	6
24[1]	**1 1/2**	1.5010 *38,125*	2.4375 *61,912*	1.135 *28,830*	1.312 *33,320*	2.284 *58,022*	0.005 *0,127*	0.030 *0,762*	2.317 *58,850*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	6
28[1]	**1 3/4**	1.7510 *44,475*	2.8750 *73,025*	1.000 *25,400*	1.125 *28,575*	2.517 *63,941*	0.005 *0,127*	0.030 *0,762*	2.753 *69,930*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	4
32[1]	**2**	*2.0010* *50,825*	*3.1875* *80,963*	*1.510* *38,354*	*1.750* *44,450*	*3.000* *76,200*	*0.005* *0,127*	*0.040* *1,016*	*3.064* *77,826*	*0.060* *1,524*	*0.010/0.020* *0,254/0,508*	6

Loads and torque

Nominal bore code	Size	Mass ≈	Static limit loads Radial C_s	 Axial C_a[3]	Radial dynamic load C25	Starting torque Standard	 Standard, SKF precision	 Reduced[4] Max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*		
10	**5/8**	0,12 *54*	30 500 *135,72*	4 720 *21,00*	16 450 *73,20*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
12	**3/4**	0.21 *95*	46 400 *206,48*	6 750 *30,03*	23 600 *105,02*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
14	**7/8**	0.27 *122*	62 200 *276,79*	9 350 *41,60*	30 250 *134,61*	1/25 *0,11/2,82*	2/8 *0,23/0,9*	2 *0,23*
16	**1**	0.39 *176*	82 200 *365,79*	12 160 *54,11*	38 000 *169,10*	1/25 *0,11/2,82*	2/8 *0,23/0,9*	2 *0,23*
20[1]	**1 1/4**	0.53 *240*	91 011 *405,00*	17 528 *78,00*	45 025 *200,27*	2/20 *0,23/2,26*	2.5/13 *0,28/1,47*	2.2 *0,25*
24[1]	**1 1/2**	0.89 *405*	139 363 *619,39*	26 339 *117,06*	72 410 *322,08*	2/20 *0,23/2,26*	2.5/15.5 *0,28/1,75*	2.5 *0,28*
28[1]	**1 3/4**	1.20 *545*	127 432 *567,07*	19 924 *88,55*	65 124 *289,67*	10/35 *1,3/3,9*	4.5/19 *0,5/2,15*	4.5 *0,5*
32[1]	**2**	*2.10* *953*	*298 200* *1 326,46*	*51 905* *230,88*	*144 579* *643,12*	*10/35* *1,3/3,9*	*10.0/35.0* *1,3/3,9*	*4.5* *0,5*

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[1] SKF option [2] Parts are delivered and marked with SKF standard XRE..A., 11LHN (inner ring spherical surface coated) or 11LBN.. references.

[3] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to XRE..A, 11LHN.. or 11LBN..

Examples:	ZNAS12ARXTTFY2 NAS 3APPD	Z	E	NAS	12	A	R	X	TT	F	Y2

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Inner ring material

No code	440C
E	PH13.8

Basic designation

Bore code (multiples of 1/16 inch)

Chamfer and groove

No code	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
XS[1]	Standard, SKF precision
X	Reduced

Shield and seal

No code	No shield and seal
TT[2]	Sealed
PP[2]	Shielded

Material and surface treatment of inner ring code

No code	Passivated inner ring
F[1]	Chromium plated sphere
D[1]	XCR plating on sphere (chromium 6 free replacement to chromium plating)
K[1] [3]	XLHP coated sphere
N[1] [3]	XLNT coated sphere
H[1] [3]	XL coated sphere

Oversize

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 ≥ 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

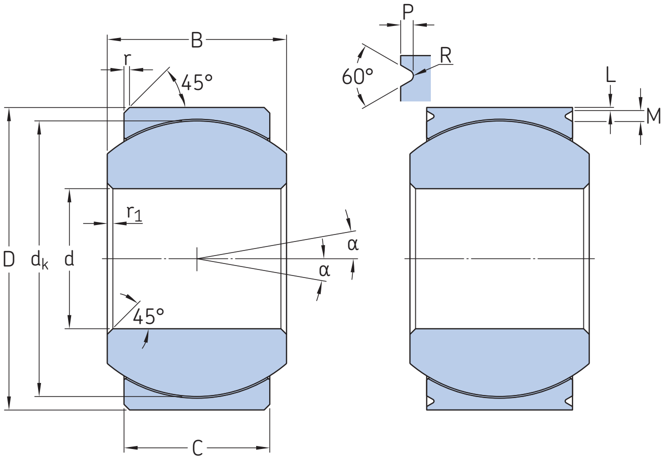
---

[4] If starting torque is ≤ 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*

2.28 Self-lubricating wide (inch dimensions)

SW... bore code **03** to **10**



SW..Z

SW..G

Technical specification	AS 8942
Product standards	NSA 8135 (chamfered outer ring) NSA 8137 (grooved outer ring)
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C
Outer ring	Corrosion-resistant steel 17-4PH

Nominal bore code	**L** +0.010/0 *+0,254/0*	**M** +0.010/0 *+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 bore code	**Size**	**Dimensions**									
		d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.010 *0/–0,254*	B 0/–0.002 *0/–0,051*	d_k ≈	r +0.010/0 *+0,254/0*	r_1 +0.010/0 *+0,254/0*	P +0.015/0 *+0,381/0*	R +0.010/0 *+0,254/0*	α
–		in/*mm*									°
03	3/16	0.1900 *4,8260*	0.6250 *15,8750*	0.332 *8,433*	0.437 *11,100*	0.531 *13,487*	0.015 *0,381*	0.005 *0,127*	0.015 *0,381*	0.005 *0,127*	17
04	1/4	0.2500 *6,3500*	0.6250 *15,8750*	0.332 *8,433*	0.437 *11,100*	0.531 *13,487*	0.015 *0,381*	0.005 *0,127*	0.015 *0,381*	0.005 *0,127*	17
05	5/16	0.3125 *7,9375*	0.6875 *17,4625*	0.322 *8,179*	0.437 *11,100*	0.593 *15,062*	0.015 *0,381*	0.005 *0,127*	0.015 *0,381*	0.005 *0,127*	14
06	3/8	0.3750 *9,5250*	0.8125 *20,6375*	0.411 *10,439*	0.500 *12,700*	0.687 *17,450*	0.015 *0,381*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	10
07	7/16	0.4375 *11,1125*	0.9375 *23,8125*	0.447 *11,354*	0.562 *14,275*	0.781 *19,837*	0.015 *0,381*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	12
08	1/2	0.5000 *12,7000*	1.0000 *25,4000*	0.510 *12,954*	0.625 *15,875*	0.875 *22,225*	0.020 *0,508*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	9
09	9/16	0.5625 *14,2875*	1.1250 *28,5750*	0.541 *13,741*	0.687 *17,450*	1.000 *25,400*	0.020 *0,508*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	11
10	5/8	0.6250 *15,8750*	1.1875 *30,1625*	0.572 *14,529*	0.750 *19,050*	1.062 *26,975*	0.020 *0,508*	0.005 *0,127*	*0.025* *0,635*	*0.010* *0,254*	12

Designation system

Examples: SW03GXCY2
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
C1)	Cadmium plated external dimensions
J1)	Zinc-nickel plated external dimensions

Oversize

No code	Standard outer diameter size
Y11)	0.005 in/0,127 mm oversized outer diameter
Y21)	0.010 in/0,254 mm oversized outer diameter
Y31)	0.015 in/0,381 mm oversized outer diameter
Y41)	0.020 in/0,508 mm oversized outer diameter

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1) SKF option

Loads and torque

Nominal bore code	Size	Mass ≈	Static limit loads Radial C_s	Axial C_a2)	Radial limit load C25	Starting torque Standard	Reduced starting torque3) Max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*	
03	3/16	0.03 *13,6*	9 000 *40,03*	1 770 *7,87*	3 770 *16,77*	1.0/5.0 *0,11/0,56*	0.5 *0,06*
04	1/4	0.03 *13,6*	9 000 *40,03*	1 770 *7,87*	3 770 *16,77*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
05	5/16	0.03 *13,6*	9 400 *41,81*	1 640 *7,29*	4 645 *20,66*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
06	3/8	0.05 *22,7*	13 700 *60,94*	2 628 *11,69*	6 389 *28,42*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
07	7/16	0.08 *36,3*	20 700 *92,07*	3 650 *16,23*	9 388 *41,76*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
08	1/2	0.10 *45,4*	27 500 *122,32*	4 989 *22,19*	12 149 *54,04*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
09	9/16	0.14 *63,5*	34 400 *153,01*	5 368 *23,88*	14 979 *66,63*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
10	5/8	0.16 *72,6*	*39 000* *173,48*	6 128 *27,26*	16 688 *74,23*	*1.0/5.0* *0,11/0,56*	*1.0* *0,11*

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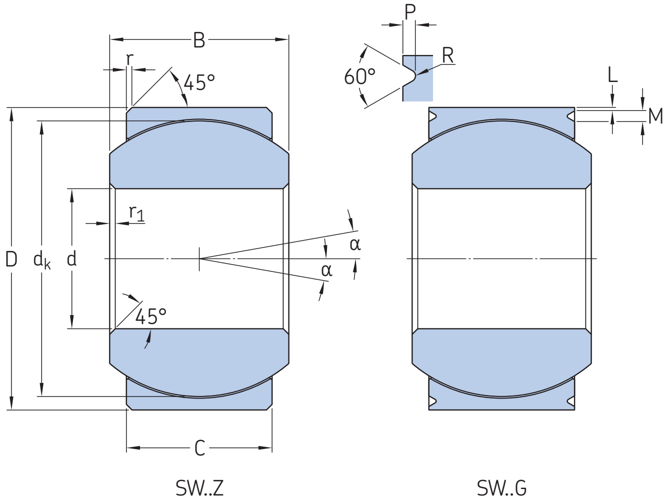
2) These values can be limited by the unstaking load (contact SKF for more information)
3) The minimum starting torque is limited by zero radial and axial internal clearance

2.28 Self-lubricating wide (inch dimensions)

SW... bore code **12** to **32**



Technical specification	AS 8942
Product standards	NSA 8135 (chamfered outer ring) NSA 8137 (grooved outer ring)
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C
Outer ring	Corrosion-resistant steel 17-4PH

Nominal bore code	**L** +0.010/0 *+0,254/0*	**M** +0.010/0 *+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 bore code	**Size**	**Dimensions**									
		d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.010 *0/–0,254*	B 0/–0.002 *0/–0,051*	d_k ≈	r +0.010/0 *+0,254/0*	r_1 +0.010/0 *+0,254/0*	P +0.015/0 *+0,381/0*	R +0.010/0 *+0,254/0*	α
–		in/*mm*									°
12	3/4	0.7500 *19,0500*	1.3750 *34,9250*	0.635 *16,129*	0.875 *22,225*	1.250 *31,750*	0.020 *0,508*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	14
14	7/8	0.8750 *22,2250*	1.6250 *41,2750*	0.760 *19,304*	0.875 *22,225*	1.375 *34,925*	0.020 *0,508*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	7
16	1	1.0000 *25,4000*	2.1250 *53,9750*	1.010 *25,654*	1.375 *34,925*	1.937 *49,200*	0.020 *0,508*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	15
20	1 1/4	1.2500 *31,7500*	2.3750 *60,3250*	1.135 *28,829*	1.500 *38,100*	2.156 *54,762*	0.030 *0,763*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	12
24	1 1/2	1.5000 *38,1000*	2.6875 *68,2625*	1.228 *31,191*	1.687 *42,850*	2.437 *61,900*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	12
28	1 3/4	1.7500 *44,4500*	3.0000 *76,2000*	1.322 *33,579*	1.812 *46,025*	2.750 *69,850*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	12
32	2	2.0000 *50,8000*	3.2500 *82,5500*	1.385 *35,179*	1.937 *49,200*	3.000 *76,200*	0.040 *1,016*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	12

Designation system

Examples: SW03GXCY2
SW10Z

SW 03 G X C Y2

Basic designation – SW

Bore code (multiples of 1/16 inch) – 03

Chamfer and groove – G

Z	Chamfered outer ring
G	Grooved outer ring

Starting torque – X

No code	Standard
X	Reduced

Surface treatment of outer ring – C

No code	Not plated
C1)	Cadmium plated external dimensions
J1)	Zinc-nickel plated external dimensions

Oversize – Y2

No code	Standard outer diameter size
Y11)	0.005 in/0,127 mm oversized outer diameter
Y21)	0.010 in/0,254 mm oversized outer diameter
Y31)	0.015 in/0,381 mm oversized outer diameter
Y41)	0.020 in/0,508 mm oversized outer diameter

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1) SKF option

Loads and torque

Nominal bore code	**Size**	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a2)	**Radial limit load** C25	**Starting torque** Standard	Reduced starting torque3) Max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*	
12	**3/4**	0.23 *104,3*	52 300 *232,64*	7 730 *34,38*	22 101 *98,31*	1.0/5.0 *0,11/0,56*	1.0 *0,11*
14	**7/8**	0.35 *158,8*	67 300 *299,36*	10 800 *48,04*	28 198 *125,43*	2.0/8.0 *0,23/0,90*	2.0 *0,23*
16	**1**	0.97 *440,0*	137 000 *609,40*	19 300 *85,85*	53 698 *238,86*	2.0/8.0 *0,23/0,90*	2.0 *0,23*
20	**1 1/4**	1.10 *500,0*	127 781 *568,40*	26 058 *115,91*	66 447 *295,57*	2.0/16.0 *0,23/1,81*	2.2 *0,25*
24	**1 1/2**	1.54 *700,0*	158 715 *706,00*	30 963 *137,73*	82 532 *367,12*	2.0/16.0 *0,23/1,81*	2.2 *0,25*
28	**1 3/4**	1.98 *900,0*	193 210 *859,44*	36 363 *161,75*	100 175 *445,60*	2.0/16.0 *0,23/1,81*	2.2 *0,25*
32	**2**	2.31 *1 050,0*	223 946 *996,16*	40 466 *180,00*	116 451 *518,00*	2.0/16.0 *0,23/1,81*	2.2 *0,25*

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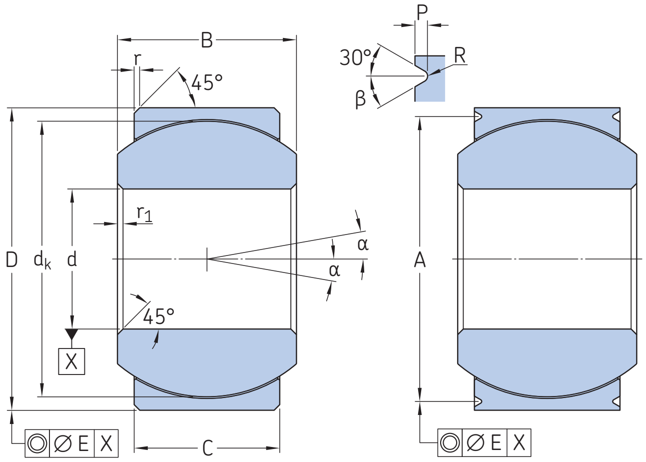
2) These values can be limited by the unstaking load (contact SKF for more information)
3) The minimum starting torque is limited by zero radial and axial internal clearance

2.29 Self-lubricating wide (inch dimensions)

WAS.. (XRL.., 11HW.. or 11BW..)[1] bore code **3** to **9**



WAS..   WAS..R

Technical specification	AS 81820
Product standards	AS 14102 (chamfered outer ring) AS 14103 (grooved outer ring)
Materials	
Liner	X1
Inner ring	Passivated corrosion-resistant steel 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 bore code	**Size**	**Dimensions** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	d1 ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,2*	P 0/–0.010 *0/–0,254*	R	α
–		in/*mm*											°
3	3/16	0.1900 *4,826*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.530 *13,464*	0.300 *7,62*	0.010 *0,254*	0.010 *0,254*	0.563 *14,300*	0.025 *0,635*	0.005/0.010 *0,127/0,254*	15
4	1/4	0.2500 *6,350*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.530 *13,464*	0.300 *7,62*	0.010 *0,254*	0.010 *0,254*	0.563 *14,300*	0.025 *0,635*	0.005/0.010 *0,127/0,254*	15
5	5/16	0.3125 *7,937*	0.6875 *17,462*	0.317 *8,052*	0.437 *11,100*	0.566 *14,381*	0.360 *9,14*	0.010 *0,254*	0.010 *0,254*	0.625 *15,875*	0.025 *0,635*	0.005/0.010 *0,127/0,254*	14
6	3/8	0.3750 *9,525*	0.8125 *20,637*	0.406 *10,312*	0.500 *12,700*	0.683 *17,361*	0.466 *11,84*	0.010 *0,254*	0.020 *0,508*	0.712 *18,085*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	8
7	7/16	0.4375 *11,112*	0.9375 *23,812*	0.442 *11,227*	0.562 *14,275*	0.777 *19,744*	0.537 *13,64*	0.010 *0,254*	0.020 *0,508*	0.837 *21,260*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	10
7A	7/16	0.4375 *11,112*	0.9062 *23,017*	0.442 *11,227*	0.562 *14,275*	0.777 *19,744*	0.537 *13,64*	0.010 *0,254*	0.020 *0,508*	0.806 *20,472*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	10
8	1/2	0.5000 *12,700*	1.0000 *25,400*	0.505 *12,827*	0.625 *15,875*	0.871 *22,130*	0.607 *15,42*	0.010 *0,254*	0.020 *0,508*	0.900 *22,860*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	9
9	9/16	0.5625 *14,288*	1.1250 *28,575*	0.536 *13,614*	0.687 *17,450*	0.996 *25,296*	0.721 *18,310*	0.010 *0,254*	0.020 *0,508*	*1.025* *26,035*	*0.035* *0,889*	*0.010/0.017* *0,254/0,432*	10

Loads and torque

Nominal bore code	**Size**	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[2]	**Radial dynamic load** C25	**Starting torque** Standard	Standard, SKF precision	Reduced[3] max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*		
3	3/16	0.03 *14*	2 500 *11,12*	1 770 *7,88*	4 900 *21,80*	0.25/5 *0,03/0,56*	0.5/5 *0,06/0,56*	0.5 *0,06*
4	1/4	0.03 *14*	5 500 *24,47*	1 770 *7,88*	4 900 *21,80*	0.25/5 *0,03/0,56*	1/5 *0,11/0,56*	0.5 *0,06*
5	5/16	0.035 *16*	9 400 *41,83*	1 640 *7,30*	6 050 *26,88*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
6	3/8	0.06 *27*	13 700 *60,96*	2 630 *11,70*	8 310 *36,98*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
7	7/16	0.08 *38*	20 700 *92,11*	3 650 *16,24*	11 750 *52,29*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
7A	7/16	0.08 *38*	19 700 *87,63*	3 650 *16,24*	11 750 *52,29*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
8	1/2	0.10 *45*	21 400 *95,23*	4 970 *22,12*	14 950 *66,53*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
9	9/16	0.135 *61*	*26 600* *118,37*	5 370 *23,90*	18 100 *80,54*	*0.25/8* *0,03/0,90*	*1/5* *0,11/0,56*	*1* *0,11*

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[1] Parts are delivered and marked with SKF standard XRL.., 11HW.. (inner ring spherical surface coated) or 11BW.. references.
[2] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to XRL.., 11HW.. or 11BW..

Examples: ZWAS12RXTTFY2
WAS 3PPD

Z	E	WAS	12	R	X	TT	F	R

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Inner ring material

No code	440C
E	PH13.8

Basic designation

Bore code (multiples of 1/16 inch)

Chamfer and groove

No code3)	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
XS1)	Standard, SKF precision
X	Reduced

Shield and seal

No code	No shield and seal
TT2)	Sealed
PP2)	Shielded

Material and surface treatment of inner ring code

No code	Passivated inner ring
F1)	Chromium plated sphere
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
K1) 4)	XLHP coated sphere
N1) 4)	XLNT coated sphere
H1) 4)	XL coated sphere

Oversize

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

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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

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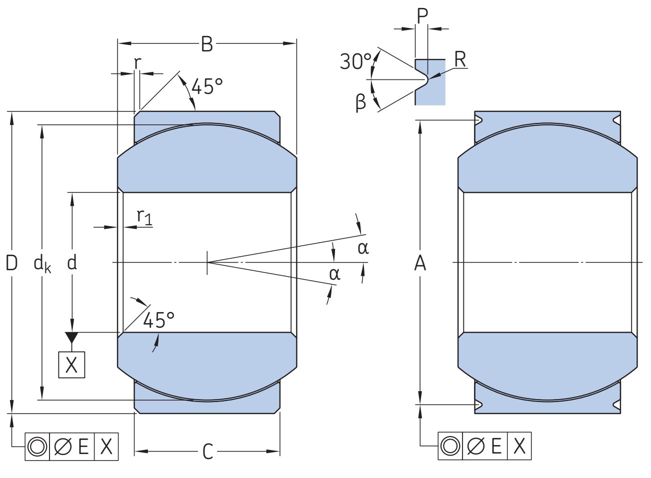
3) If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

Nominal bore code	**Maximum radial clearance**	**Maximum axial clearance**
-	in/*mm*	
≤ 12	0.0007/*0,0178*	0.0021/*0,0533*
≥ 14	0.0010/*0,0254*	0.0040/*0,1016*

2.29 Self-lubricating wide (inch dimensions)

WAS.. (XRL.., 11HW.. or 11BW..)[2] bore code **10** to **32**



WAS..　　WAS..R

Technical specification	AS 81820
Product standards	AS 14102 (chamfered outer ring) AS 14103 (grooved outer ring)
Materials	
Liner	X1
Inner ring	Passivated corrosion-resistant steel 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 bore code	**Size**	**Dimensions** d 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	d1 ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,2*	P 0/–0.010 *0/–0,254*	R	α
–		in/*mm*											°
10	**5/8**	0.6250 *15,875*	1.1875 *30,162*	0.567 *14,400*	0.750 *19,050*	1.059 *26,887*	0.747 *18,97*	0.010 *0,254*	0.020 *0,508*	1.087 *27,610*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	12
12	**3/4**	0.7500 *19,050*	1.3750 *34,925*	0.630 *16,002*	0.875 *22,225*	1.216 *30,897*	0.845 *21,46*	0.010 *0,254*	0.030 *0,762*	1.251 *31,775*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	13
14	**7/8**	0.8750 *22,225*	1.6250 *41,275*	0.755 *19,177*	0.875 *22,225*	1.325 *33,655*	0.995 *25,27*	0.010 *0,254*	0.030 *0,762*	1.501 *38,125*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	6
16	**1**	1.0000 *25,400*	2.1250 *53,975*	1.005 *25,527*	1.375 *34,925*	1.871 *47,526*	1.269 *32,23*	0.010 *0,254*	0.030 *0,762*	2.001 *50,825*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	12
20[1]	**1 1/4**	1.2500 *31,750*	2.3750 *60,325*	1.130 *28,700*	1.500 *38,100*	2.095 *53,203*	1.462 *37,15*	0.010 *0,254*	0.030 *0,762*	2.253 *57,230*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	12
24[1]	**1 1/2**	1.5000 *38,100*	2.6875 *68,260*	1.223 *31,064*	1.687 *42,850*	2.393 *60,779*	1.697 *43,10*	0.010 *0,254*	0.030 *0,762*	2.565 *65,160*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	12
28[1]	**1 3/4**	1.7500 *44,450*	3.0000 *76,200*	1.317 *33,450*	1.812 *46,020*	2.673 *67,892*	1.965 *49,90*	0.010 *0,254*	0.030 *0,762*	2.878 *73,100*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	12
32[1]	**2**	2.0000 *50,800*	3.2500 *82,550*	1.380 *35,050*	1.937 *49,190*	2.938 *74,624*	2.209 *56,10*	0.010 *0,254*	0.030 *0,762*	*3.128* *79,451*	*0.060* *1,524*	*0.010/0.020* *0,254/0,508*	12

Loads and torque

Nominal bore code	**Size**	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a[3]	**Radial dynamic load** C25	**Starting torque** Standard	Standard, SKF precision	Reduced[4] max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*		
10	**5/8**	0.16 *73*	29 000 *129,00*	6 130 *27,28*	20 250 *90,11*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
12	**3/4**	0.24 *109*	37 000 *164,65*	7 730 *34,40*	26 200 *116,59*	0.25/8 *0,03/0,90*	1/5 *0,11/0,56*	1 *0,11*
14	**7/8**	0.35 *159*	65 200 *290,14*	10 800 *48,06*	33 600 *149,52*	0.25/12 *0,03/1,36*	2/8 *0,23/0,9*	2 *0,23*
16	**1**	0.97 *440*	104 000 *462,80*	19 300 *85,88*	56 250 *250,31*	0.25/12 *0,03/1,36*	2/8 *0,23/0,9*	2 *0,23*
20[1]	**1 1/4**	1.10 *500*	127 890 *568,40*	26 080 *115,91*	66 450 *295,57*	2/20 *0,23/2,26*	2.4/15.5 *0,28/1,75*	2.4 *0,28*
24[1]	**1 1/2**	1.54 *700*	158 850 *706,00*	30 989 *137,73*	82 536 *367,12*	2/20 *0,23/2,26*	2.4/15.5 *0,28/1,75*	2.4 *0,28*
28[1]	**1 3/4**	1.99 *900*	193 374 *859,44*	36 934 *161,75*	72 410 *445,60*	10/35 *1,3/3,9*	4.5/19 *0,5/2,15*	4.5 *0,5*
32[1]	**2**	2.31 *1 050*	*224 136* *996,16*	40 449 *180,00*	116 457 *518,00*	*10/35* *1,3/3,9*	*4.5/19* *0,5/2,15*	*4.5* *0,5*

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[1] SKF option　[2] Parts are delivered and marked with SKF standard XRL.., 11HW.. (inner ring spherical surface coated) or 11BW.. references.
[3] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to XRL.., 11HW.. or 11BW..

Examples:	ZWAS12RXTTFY2 WAS 3PPD

Z E WAS 12 R X TT F R

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Inner ring material

No code	440C
E	PH13.8

Basic designation

Bore code (multiples of 1/16 inch)

Chamfer and groove

No code[3]	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
XS[1]	Standard, SKF precision
X	Reduced

Shield and seal

No code	No shield and seal
TT[2]	Sealed
PP[2]	Shielded

Material and surface treatment of inner ring code

No code	Passivated inner ring
F[1]	Chromium plated sphere
D[1]	XCR plating on sphere (chromium 6 free replacement to chromium plating)
K[1) 4]	XLHP coated sphere
N[1) 4]	XLNT coated sphere
H[1) 4]	XL coated sphere

Oversize

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

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[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

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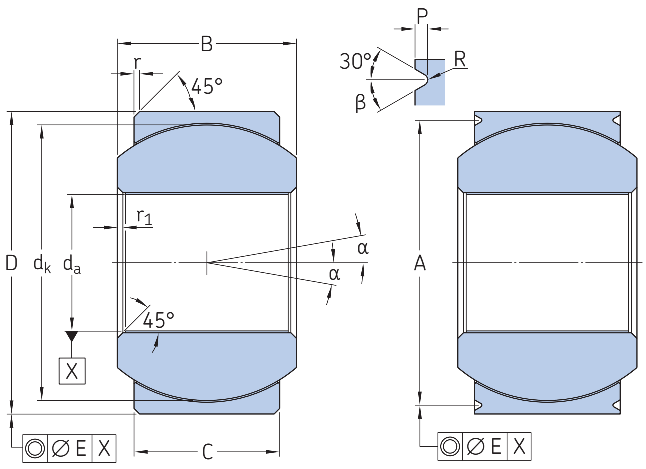
[4] If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

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..)[2] bore code **3** to **9**



WAS..A   WAS..AR

Technical specification	AS 81820
Product standards	AS 81820/2 (lined bore chamfered outer ring) AS 81820/3 (lined bore grooved outer ring)
Materials	
Liner	X1
Inner ring	Passivated corrosion-resistant steel 440C or PH13.8
Outer ring	Corrosion-resistant steel 17-4PH

β	E
°	in/*mm*
30	0.006/*0,152*

Dimensions

Nominal bore code	Size	Dimensions										
		d_a 0/–0.0010 *0/–0,0254*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,2*	P 0/–0.010 *0/–0,254*	R	α
–		in/*mm*										°
3[1]	3/16	0.1910 *4,851*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.530 *13,464*	0.005 *0,127*	0.015 *0,381*	0.563 *14,300*	0.025 *0,635*	0.005/0.012 *0,127/0,305*	15
4[1]	1/4	0.2510 *6,375*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.530 *13,464*	0.005 *0,127*	0.015 *0,381*	0.563 *14,300*	0.025 *0,635*	0.005/0.012 *0,127/0,305*	15
5	5/16	0.3135 *7,963*	0.6875 *17,462*	0.317 *8,052*	0.437 *11,100*	0.566 *14,381*	0.005 *0,127*	0.015 *0,381*	0.625 *15,875*	0.025 *0,635*	0.005/0.012 *0,127/0,305*	14
6	3/8	0.3760 *9,550*	0.8125 *20,637*	0.406 *10,312*	0.500 *12,700*	0.683 *17,361*	0.005 *0,127*	0.020 *0,508*	0.712 *18,085*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	8
7	7/16	0.4385 *11,138*	0.9375 *23,812*	0.442 *11,227*	0.562 *14,275*	0.777 *19,744*	0.005 *0,127*	0.020 *0,508*	0.837 *21,260*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	10
7A	7/16	0.4385 *11,138*	0.9062 *23,017*	0.442 *11,227*	0.562 *14,275*	0.777 *19,744*	0.005 *0,127*	0.020 *0,508*	0.806 *20,472*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	10
8	1/2	0.5010 *12,725*	1.0000 *25,400*	0.505 *12,827*	0.625 *15,875*	0.871 *22,130*	0.005 *0,127*	0.020 *0,508*	0.900 *22,860*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	9
9	9/16	0.5635 *14,313*	1.1250 *28,575*	0.536 *13,614*	0.687 *17,450*	0.996 *25,296*	0.005 *0,127*	0.020 *0,508*	*1.025* *26,035*	*0.035* *0,889*	*0.010/0.017* *0,254/0,432*	10

Loads and torque

Nominal bore code	Size	Mass ≈	Static limit loads Radial C_s	 Axial C_a[3]	Radial dynamic load C25	Starting torque Standard	 Standard, SKF precision	 Reduced[4] max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*		
3[1]	3/16	0.03 *14*	2 500 *11,12*	1 770 *7,88*	4 900 *21,80*	0.25/5 *0,03/0,56*	0.5/5 *0,06/0,56*	0.5 *0,06*
4[1]	1/4	0.03 *14*	5 500 *24,47*	1 770 *7,88*	4 900 *21,80*	0.25/5 *0,03/0,56*	1/5 *0,11/0,56*	0.5 *0,06*
5	5/16	0.035 *16*	9 400 *41,83*	1 640 *7,30*	6 050 *26,88*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
6	3/8	0.06 *27*	13 700 *60,96*	2 630 *11,70*	8 310 *36,98*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
7	7/16	0.08 *38*	20 700 *92,11*	3 650 *16,24*	11 750 *52,29*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
7A	7/16	0.08 *38*	19 700 *87,63*	3 650 *16,24*	11 750 *52,29*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
8	1/2	0.10 *45*	21 400 *95,23*	4 970 *22,12*	14 950 *66,53*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
9	9/16	0.135 *61*	*26 600* *118,37*	5 370 *23,90*	18 100 *80,54*	*1/15* *0,11/1,69*	*1/5* *0,11/0,56*	*1* *0,11*

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[1] SKF option [2] Parts are delivered and marked with SKF standard XRL..A., 11LHW (inner ring spherical surface coated) or 11LBW.. references.

[3] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to XRE..A, 11LHN.. or 11LBN..

Examples: ZWAS12ARXTTFY2
WAS 3APPD

Z	E	WAS	12	A	R	X	TT	F	Y2

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Inner ring material

No code	440C
E	PH13.8

Basic designation

Bore code (multiples of 1/16 inch)

Chamfer and groove

No code3)	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
XS1)	Standard, SKF precision
X	Reduced

Shield and seal

No code	No shield and seal
TT2)	Sealed
PP2)	Shielded

Material and surface treatment of inner ring code

No code	Passivated inner ring
F1)	Chromium plated sphere
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
K1) 4)	XLHP coated sphere
N1) 4)	XLNT coated sphere
H1) 4)	XL coated sphere

Oversize

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 ≥ 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

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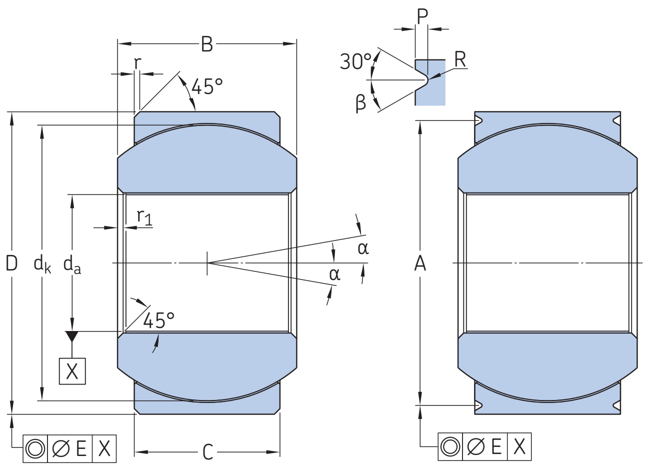
4) If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

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*	0.0030/*0,0762*

2.30 Self-lubricating wide (inch dimensions)

WAS..A (XRL..A.., 11LHW.. or 11LBW..)[2] bore code **10** to **32**



WAS..A

WAS..AR

Technical specification	AS 81820
Product standards	AS 81820/2 (lined bore chamfered outer ring) AS 81820/3 (lined bore grooved outer ring)
Materials	
Liner	X1
Inner ring	Passivated corrosion-resistant steel 440C or PH13.8
Outer ring	Corrosion-resistant steel 17-4PH

β	E
°	in/*mm*
30	0.006/*0,152*

Dimensions

Nominal bore code	Size	Dimensions d_a 0/–0.0010 *0/–0,0254*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	r_1 ±0.005 *±0,127*	r +0.010/0 *+0,254/0*	A 0/–0.008 *0/–0,2*	P 0/–0.010 *0/–0,254*	R	α
–		in/*mm*										°
10	**5/8**	0.6260 *15,900*	1.1875 *30,162*	0.567 *14,400*	0.750 *19,050*	1.059 *26,887*	0.010 *0,254*	0.020 *0,508*	1.087 *27,610*	0.035 *0,889*	0.010/0.017 *0,254/0,432*	12
12	**3/4**	0.7510 *19,075*	1.3750 *34,925*	0.630 *16,002*	0.875 *22,225*	1.216 *30,897*	0.005 *0,127*	0.030 *0,762*	1.251 *31,775*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	13
14	**7/8**	0.8760 *22,250*	1.6250 *41,275*	0.755 *19,177*	0.875 *22,225*	1.325 *33,655*	0.005 *0,127*	0.030 *0,762*	1.501 *38,125*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	6
16	**1**	1.0010 *25,425*	2.1250 *53,975*	1.005 *25,527*	1.375 *34,925*	1.871 *47,526*	0.005 *0,127*	0.030 *0,762*	2.001 *50,825*	0.055 *1,397*	0.010/0.017 *0,254/0,432*	12
20[1]	**1 1/4**	1.2510 *31,775*	2.3750 *60,325*	1.130 *28,700*	1.500 *38,100*	2.095 *53,203*	0.005 *0,127*	0.030 *0,762*	2.253 *57,230*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	12
24[1]	**1 1/2**	1.5010 *38,125*	2.6875 *68,260*	1.223 *31,064*	1.687 *42,850*	2.393 *60,779*	0.005 *0,127*	0.030 *0,762*	2.565 *65,160*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	12
28[1]	**1 3/4**	1.7510 *44,475*	3.0000 *76,200*	1.317 *33,450*	1.812 *46,020*	2.673 *67,892*	0.005 *0,127*	0.030 *0,762*	2.878 *73,100*	0.060 *1,524*	0.010/0.020 *0,254/0,508*	12
32[1]	**2**	2.0010 *50,825*	3.2500 *82,550*	1.380 *35,050*	1.937 *49,190*	2.938 *74,624*	0.005 *0,127*	0.030 *0,762*	*3.128* *79,451*	*0.060* *1,524*	*0.010/0.020* *0,254/0,508*	12

Loads and torque

Nominal bore code	Size	Mass ≈	Static limit loads Radial C_s	Axial C_a[3]	Radial dynamic load C25	Starting torque Standard	Standard, SKF precision	Reduced[4] max
–		lb/*g*	lbf/*kN*			lbf-in/*Nm*		
10	**5/8**	0.16 *73*	29 000 *129,00*	6 130 *27,28*	20 250 *90,11*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
12	**3/4**	0.24 *109*	37 000 *164,65*	7 730 *34,40*	26 200 *116,59*	1/15 *0,11/1,69*	1/5 *0,11/0,56*	1 *0,11*
14	**7/8**	0.35 *159*	65 200 *290,14*	10 800 *48,06*	33 600 *149,52*	1/25 *0,11/2,82*	2/8 *0,23/0,9*	2 *0,23*
16	**1**	0.97 *440*	104 000 *462,80*	19 300 *85,88*	56 250 *250,31*	1/25 *0,11/2,82*	2/8 *0,23/0,9*	2 *0,23*
20[1]	**1 1/4**	1.10 *500*	127 890 *568,40*	26 080 *115,91*	66 450 *295,57*	2/20 *0,23/2,26*	2.4/15.5 *0,28/1,75*	2.4 *0,28*
24[1]	**1 1/2**	1.54 *700*	158 850 *706,00*	30 989 *137,73*	82 536 *367,12*	2/20 *0,23/2,26*	2.4/15.5 *0,28/1,75*	2.4 *0,28*
28[1]	**1 3/4**	1.99 *900*	193 374 *859,44*	36 934 *161,75*	72 410 *445,60*	10/35 *1,3/3,9*	4.5/19 *0,5/2,15*	4.5 *0,5*
32[1]	**2**	2.31 *1 050*	*224 136* *996,16*	40 449 *180,00*	116 457 *518,00*	*10/35* *1,3/3,9*	*4.5/19* *0,5/2,15*	*4.5* *0,5*

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[1] SKF option [2] Parts are delivered and marked with SKF standard XRL..A., 11LHW (inner ring spherical surface coated) or 11LBW.. references.
[3] These values can be limited by the unstaking load (contact SKF for more information)

Cross-reference designation system to XRE..A, 11LHN.. or 11LBN..

Examples: ZWAS12ARXTTFY2
WAS 3APPD

Z E WAS 12 A R X TT F Y2

Surface treatment of outer ring

No code	Not plated
Z	Cadmium plated external dimensions
SZ	Zinc-nickel plated external dimensions

Inner ring material

No code	440C
E	PH13.8

Basic designation

Bore code (multiples of 1/16 inch)

Chamfer and groove

No code3)	Chamfered outer ring
R	Grooved outer ring

Starting torque

No code	Standard
XS1)	Standard, SKF precision
X	Reduced

Shield and seal

No code	No shield and seal
TT2)	Sealed
PP2)	Shielded

Material and surface treatment of inner ring code

No code	Passivated inner ring
F1)	Chromium plated sphere
D1)	XCR plating on sphere (chromium 6 free replacement to chromium plating)
K1) 4)	XLHP coated sphere
N1) 4)	XLNT coated sphere
H1) 4)	XL coated sphere

Oversize

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 ≥ 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

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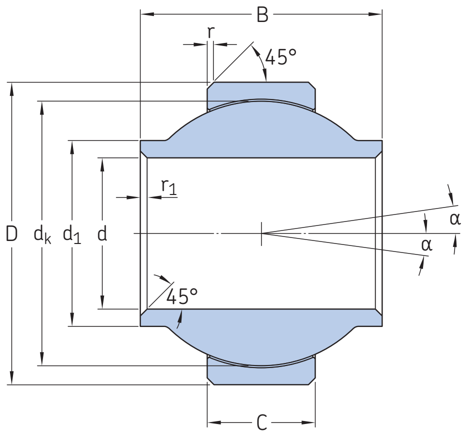
4) If starting torque is ≤ 0.1 lbf-in (0,01 Nm), maximum internal clearance must be:

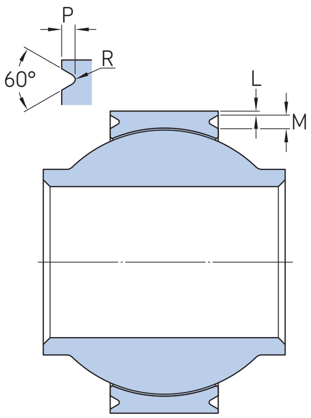
Nominal bore code	Maximum radial clearance	Maximum axial clearance
–	in/*mm*	
≤ 12	0.0007/*0,0178*	0.0021/*0,0533*
≥ 14	0.0010/*0,0254*	0.0030/*0,0762*

2.31 Self-lubricating high misalignment (inch dimensions)

SH..



SH..Z



SH..G

Technical specification	AS 81820
Product standards	SKF
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C
Outer ring	Corrosion-resistant steel 17-4PH

Nominal bore code	**L** +0.010/0 *+0,254/0*	**M** +0.010/0 *+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 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.010 *0/–0,254*	B 0/–0.002 *0/–0,051*	d_k ≈	d_1 ≈	r 0/–0.010 *0/–0,254*	r_1 +0.010/0 *+0,254/0*	P +0.015/0 *+0,381/0*	R 0/0.010 *0/0,254*	α
–		in/*mm*										°
03	3/16	0.1900 *4,8260*	0.6250 *15,8750*	0.332 *8,433*	0.560 *14,224*	0.531 *13,487*	0.28 *7,112*	0.035 *0,889*	0.005 *0,127*	0.015 *0,381*	0.005 *0,127*	15
04	1/4	0.2500 *6,3500*	0.7400 *18,7960*	0.260 *6,604*	0.593 *15,062*	0.593 *15,062*	0.35 *8,890*	0.035 *0,889*	0.005 *0,127*	0.015 *0,381*	0.005 *0,127*	24
05	5/16	0.3125 *7,9375*	0.9060 *23,0124*	0.350 *8,890*	0.813 *20,650*	0.781 *19,837*	0.48 *12,192*	0.035 *0,889*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	22
06	3/8	0.3750 *9,5250*	0.9060 *23,0124*	0.350 *8,890*	0.813 *20,650*	0.781 *19,837*	0.48 *12,192*	0.035 *0,889*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	22
07	7/16	0.4375 *11,1125*	1.0000 *25,4000*	0.350 *8,890*	0.875 *22,225*	0.875 *22,225*	0.57 *14,478*	0.035 *0,889*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	22
08	1/2	0.5000 *12,7000*	1.1250 *28,5750*	0.406 *10,312*	0.937 *23,800*	1.000 *25,400*	0.68 *17,272*	0.035 *0,889*	0.005 *0,127*	0.025 *0,635*	0.010 *0,254*	20
10	5/8	0.6250 *15,8750*	1.3750 *34,9250*	0.572 *14,529*	1.200 *30,480*	1.250 *31,750*	0.81 *20,574*	0.035 *0,889*	0.005 *0,127*	0.045 *1,143*	0.010 *0,254*	20
12	3/4	0.7500 *19,0500*	1.5625 *39,6875*	0.625 *15,875*	1.280 *32,512*	1.375 *34,925*	0.92 *23,368*	0.035 *0,889*	0.005 *0,127*	*0.045* *1,143*	*0.010* *0,254*	19
14	7/8	0.8750 *22,2250*	1.7500 *44,4500*	0.630 *16,002*	1.400 *35,560*	1.531 *38,887*	1.08 *27,432*	0.035 *0,889*	0.005 *0,127*	*0.045* *1,143*	*0.010* *0,254*	19
16	1	1.0000 *25,4000*	2.1250 *53,9750*	0.840 *21,336*	1.875 *47,625*	1.875 *47,625*	1.22 *30,988*	0.035 *0,889*	0.005 *0,127*	*0.045* *1,143*	*0.010* *0,254*	21
20	1 1/4	1.2500 *31,7500*	2.5000 *63,5000*	1.010 *25,654*	1.875 *47,625*	2.250 *57,150*	1.50 *38,100*	0.035 *0,889*	0.005 *0,127*	*0.045* *1,143*	*0.010* *0,254*	21

Designation system

Examples:	SH03GCY2 SH10Z

SH 03 G C Y2

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** ≈	**Static limit loads** Radial C_s	Axial C_a[1]	**No load dynamic torque**[2] Max
–		lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	3/16	0,03 *13,6*	9 000 *40,03*	1 550 *6,89*	5 *0,56*
04	1/4	0,04 *18,1*	7 000 *31,14*	600 *2,67*	5 *0,56*
05	5/16	0,07 *31,8*	14 000 *62,28*	1 600 *7,12*	5 *0,56*
06	3/8	0,07 *31,8*	14 000 *62,28*	1 600 *7,12*	5 *0,56*
07	7/16	0,10 *45,4*	15 000 *66,72*	1 700 *7,56*	8 *0,90*
08	1/2	0,16 *72,6*	20 000 *88,96*	2 500 *11,12*	8 *0,90*
10	5/8	0,25 *113,4*	37 000 *164,58*	4 000 *17,79*	8 *0,90*
12	3/4	0,32 *145,1*	*45 500* *202,39*	4 800 *21,35*	8 *0,90*
14	7/8	0,43 *195,0*	*50 000* *222,41*	5 000 *22,24*	8 *0,90*
16	1	0,81 *367,4*	*85 000* *378,10*	11 100 *49,38*	8 *0,90*
20	1 1/4	1,11 *503,5*	*124 000* *551,58*	13 500 *60,05*	20 *2,26*

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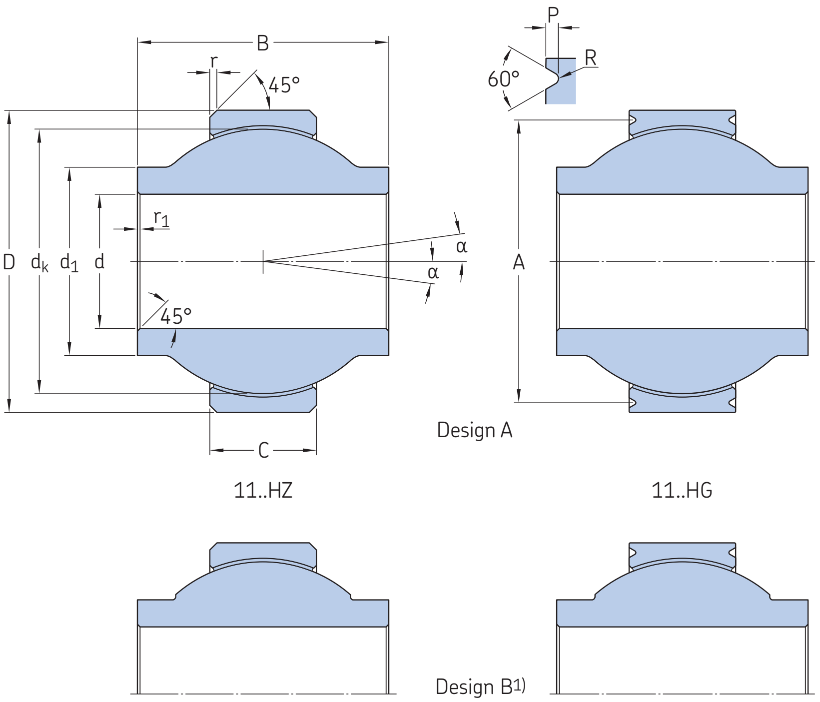
[1] These values can be limited by the unstaking load (contact SKF for more information)

[2] The minimum starting torque is limited by zero radial and axial internal clearance

2.32 Self-lubricating high misalignment (inch dimensions)

11..H



Design A

11..HZ

11..HG

Design B[1]

Technical specification	AS 81820
Product standards	SKF
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 0/–0.0005 *0/–0,0127*	D 0/–0.0005 *0/–0,0127*	C 0/–0.010 *0/–0,254*	B 0/–0.002 *0/–0,051*	d_k ≈	d_1 ≈	r +0.010/0 *+0,254/0*	r_1 +0.010/0 *+0,254/0*	A 0/–0.010 *0/–0,254*
–		in/*mm*								
03	3/16	0.1900 *4,8260*	0.5625 *14,2875*	0.215 *5,461*	0.500 *12,700*	0.437 *11,100*	0.312 *7,925*	0.025 *0,635*	0.005 *0,127*	0.502 *12,751*
031	3/16	0.1900 *4,8260*	0.6250 *15,8750*	0.332 *8,433*	0.560 *14,224*	0.531 *13,487*	0.280 *7,112*	0.025 *0,635*	0.005 *0,127*	0.560 *14,224*
04	1/4	0.2500 *6,3500*	0.7400 *18,7960*	0.260 *6,604*	0.593 *15,062*	0.593 *15,062*	0.350 *8,890*	0.025 *0,635*	0.005 *0,127*	0.675 *17,145*
05	5/16	0.3125 *7,9375*	0.9060 *23,0124*	0.350 *8,890*	0.813 *20,650*	0.781 *19,837*	0.480 *12,192*	0.025 *0,635*	0.005 *0,127*	0.811 *20,599*
051	5/16	0.3125 *7,9375*	0.6875 *17,4625*	0.245 *6,223*	0.625 *15,875*	0.593 *15,062*	0.420 *10,668*	0.025 *0,635*	0.005 *0,127*	0.637 *16,180*
06	3/8	0.3750 *9,5250*	0.9060 *23,0124*	0.350 *8,890*	0.813 *20,650*	0.781 *19,837*	0.480 *12,192*	0.025 *0,635*	0.005 *0,127*	0.811 *20,599*
07	7/16	0.4375 *11,1125*	1.0000 *25,4000*	0.350 *8,890*	0.875 *22,225*	0.875 *22,225*	0.570 *14,478*	0.025 *0,635*	0.005 *0,127*	0.905 *22,987*
08	1/2	0.5000 *12,7000*	1.1250 *28,5750*	0.406 *10,312*	0.937 *23,800*	1.000 *25,400*	0.680 *17,272*	0.025 *0,635*	0.005 *0,127*	1.030 *26,162*
10	5/8	0.6250 *15,8750*	1.3750 *34,9250*	0.572 *14,529*	1.200 *30,480*	1.250 *31,750*	0.810 *20,574*	0.025 *0,635*	0.005 *0,127*	1.255 *31,877*
12	3/4	0.7500 *19,0500*	1.5625 *39,6875*	0.625 *15,875*	1.280 *32,512*	1.375 *34,925*	0.920 *23,368*	0.025 *0,635*	0.005 *0,127*	1.442 *36,627*
14	7/8	0.8750 *22,2250*	1.7500 *44,4500*	0.630 *16,002*	1.400 *35,560*	1.531 *38,887*	1.080 *27,432*	0.025 *0,635*	0.005 *0,127*	1.630 *41,402*
16	1	1.0000 *25,4000*	2.1250 *53,9750*	0.840 *21,336*	1.875 *47,625*	1.875 *47,625*	1.220 *30,988*	0.025 *0,635*	0.005 *0,127*	2.005 *50,927*
20	1 1/4	1.2500 *31,7500*	2.5000 *63,5000*	1.010 *25,654*	1.875 *47,625*	2.250 *57,150*	1.500 *38,100*	0.025 *0,635*	0.005 *0,127*	2.380 *60,452*
24	1 1/2	1.5000 *38,1000*	3.0000 *76,2000*	1.180 *29,972*	2.250 *57,150*	2.672 *67,869*	1.802 *45,771*	0.025 *0,635*	0.005 *0,127*	2.880 *73,152*

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[1] Slight reduction of misalignment angle α (contact SKF for more information)

Designation system

Examples: 11BHG03EXCY2
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

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

Dimensions cont., loads and torque

Nominal bore code	Size	Dimensions P 0/–0.015 *0/–0,381*	 R 0/–0.010 *0/–0,254*	α[1]	Mass ≈	Static limit loads Radial C_s	 Axial C_a[2]	Starting torque Standard	 Reduced[3]
–		in/*mm*		°	lb/*g*	lbf/*kN*		lbf-in/*Nm*	
03	**3/16**	0.030 *0,762*	0.015 *0,381*	15	0.02 *9,1*	4 970 *22,11*	315 *1,40*	0.25/5.0 *0,03/0,56*	0.5 *0,06*
031	**3/16**	0.030 *0,762*	0.015 *0,381*	15	0.03 *13,6*	10 500 *46,71*	1 785 *7,94*	0.25/5.0 *0,03/0,56*	0.5 *0,06*
04	**1/4**	0.030 *0,762*	0.015 *0,381*	24	0.04 *18,1*	8 120 *36,12*	700 *3,11*	0.25/5.0 *0,03/0,56*	0.5 *0,06*
05	**5/16**	0.040 *1,016*	0.020 *0,508*	22	0.07 *31,8*	16 310 *72,55*	1 855 *8,25*	0.25/5.0 *0,03/0,56*	1 *0,11*
051	**5/16**	0.030 *0,762*	0.015 *0,381*	20	0.03 *13,6*	7 910 *35,19*	525 *2,34*	0.25/5.0 *0,03/0,56*	1 *0,11*
06	**3/8**	0.040 *1,016*	0.020 *0,508*	22	0.07 *31,8*	16 310 *72,55*	1 855 *8,25*	0.25/5.0 *0,03/0,56*	1 *0,11*
07	**7/16**	0.040 *1,016*	0.020 *0,508*	22	0.10 *45,4*	17 500 *77,84*	1 960 *8,72*	0.50/8.0 *0,06/0,9*	1 *0,11*
08	**1/2**	0.040 *1,016*	0.020 *0,508*	20	0.16 *72,6*	23 310 *103,69*	2 905 *12,92*	0.50/8.0 *0,06/0,9*	1 *0,11*
10	**5/8**	0.060 *1,524*	0.020 *0,508*	20	0.25 *113,4*	43 120 *191,81*	6 600 *29,36*	1.0/8.0 *0,11/0,90*	1 *0,11*
12	**3/4**	0.060 *1,524*	0.020 *0,508*	19	0.32 *145,1*	53 060 *236,02*	7 700 *34,25*	1.0/8.0 *0,11/0,90*	1 *0,11*
14	**7/8**	0.060 *1,524*	0.020 *0,508*	19	0.43 *195,0*	58 310 *259,38*	7 700 *34,25*	1.0/8.0 *0,11/0,90*	2 *0,23*
16	**1**	0.060 *1,524*	0.020 *0,508*	21	0.81 *367,4*	99 120 *440,91*	15 400 *68,50*	2.0/12.0 *0,23/1,36*	2 *0,23*
20	**1 1/4**	0.060 *1,524*	0.020 *0,508*	21	1.11 *503,5*	144 620 *643,30*	23 100 *102,75*	2.0/20.0 *0,23/2,26*	2 *0,23*
24	**1 1/2**	0.060 *1,524*	0.020 *0,508*	21	2.22 *1 007,0*	211 330 *940,04*	27 930 *124,24*	2.0/20.0 *0,23/2,26*	2 *0,23*

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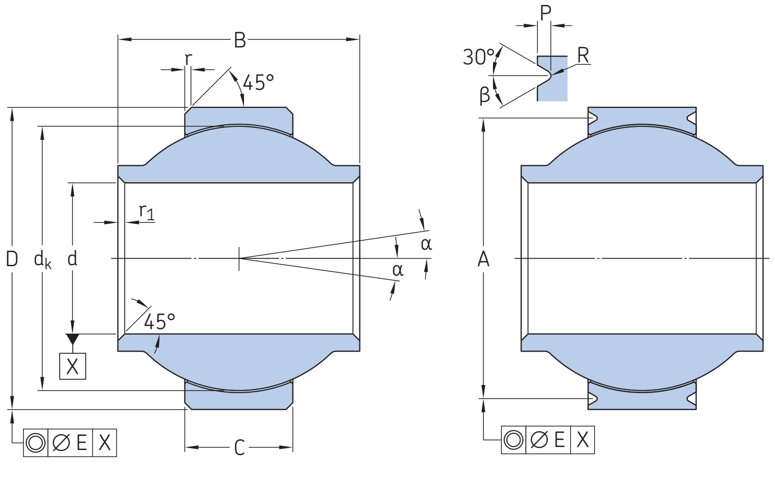
[1] Values are valid for design A. For design B, the misalignment angle α is slightly reduced (contact SKF for more information) [2] These values can be limited by the unstaking load (contact SKF for more information) 3) The minimum starting torque is limited by zero radial and axial internal clearance

2.33 Self-lubricating high misalignment (inch dimensions)

XRT.. bore code **4,83** to **12,7**



XRT XRT..R

Technical specification	AS 81820
Product standards	SKF
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 *4,826/11,112*	20	0.005 *0,127*
0.5000/1.2500 *12,7/31,75*	30	0.005 *0,127*

Dimensions

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** d Bore without liner 0/–0.0005 *0/–0,0127*	d_a = d with lined bore + 0.0010/0 *+ 0,0250/0*	D 0/–0.0005 *0/–0,0127*	C ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	d_k ≈	d_1 ≈	r_1 +0.012/0 *+0,3/0*	r +0.015/0 *+0,381/0*	A +0.010/0 *+0,254/0*	P 0/–0.010 *0/–0,254*
–		in/*mm*										
4,83	**03**	0.1900 *4,826*	0.1900 *4,826*	0.5625 *14,288*	0.205 *5,207*	0.500 *12,700*	0.437 *11,100*	0.315 *8,001*	0.004 *0,100*	0.020 *0,508*	0.502 *12,751*	0.030 *0,762*
6,35	**04**	0.2500 *6,350*	0.2500 *6,350*	0.7400 *18,796*	0.250 *6,350*	0.593 *15,062*	0.594 *15,080*	0.386 *9,804*	0.004 *0,100*	0.020 *0,508*	0.669 *17,000*	0.030 *0,762*
7,94	**05**	0.3125 *7,938*	0.3125 *7,938*	0.9060 *23,012*	0.340 *8,636*	0.813 *20,650*	0.781 *19,838*	0.512 *13,005*	0.004 *0,100*	0.020 *0,508*	0.831 *21,100*	0.030 *0,762*
9,52	**06**	0.3750 *9,525*	0.3750 *9,525*	0.9060 *23,012*	0.340 *8,636*	0.813 *20,650*	0.781 *19,838*	0.532 *13,513*	0.004 *0,100*	0.020 *0,508*	0.831 *21,100*	0.030 *0,762*
11,11	**07**	0.4375 *11,112*	0.4375 *11,112*	1.0000 *25,400*	0.340 *8,636*	0.875 *22,225*	0.866 *22,000*	0.620 *15,748*	0.004 *0,100*	0.020 *0,508*	0.925 *23,500*	0.030 *0,762*
12,7	**08**	0.5000 *12,700*	0.5000 *12,700*	1.1250 *28,575*	0.396 *10,058*	0.937 *23,799*	0.984 *25,000*	0.728 *18,491*	0.004 *0,100*	0.020 *0,508*	1.047 *26,600*	0.030 *0,762*

Dimensions cont., loads and torque

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** R	α	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a¹⁾	**Radial dynamic load** C25	**Starting torque** Standard	Reduced Max
–		in/*mm*	°	lb/*g*	lbf/*kN*			lbf-in/*Nm*	
4,83	**03**	0.005/0.010 *0,127/0,254*	15	0.02 *9*	3 642 *16,2*	899 *4,0*	1 461 *6,50*	0.5/2.5 *0,06/0,28*	0.5 *0,06*
6,35	**04**	0.005/0.010 *0,127/0,254*	24	0.04 *18*	6 924 *30,8*	517 *2,3*	2 765 *12,3*	0.5/2.5 *0,06/0,28*	0.5 *0,06*
7,94	**05**	0.005/0.010 *0,127/0,254*	23	0.07 *32*	12 544 *55,80*	1 304 *5,80*	5 013 *22,3*	0.7/3.5 *0,080/0,40*	1 *0,11*
9,52	**06**	0.005/0.010 *0,127/0,254*	22	0.07 *32*	12 544 *55,8*	1 304 *5,8*	5 013 *22,3*	0.9/4.5 *0,10/0,51*	1 *0,11*
11,11	**07**	0.005/0.010 *0,127/0,254*	22	0.10 *45*	13 286 *59,1*	1 394 *6,2*	5 305 *23,6*	0.9/4.5 *0,10/0,51*	1 *0,11*
12,7	**08**	0.005/0.010 *0,127/0,254*	20	0.16 *73*	18 906 *84,1*	2 360 *10,5*	7 553 *33,6*	0.9/4.5 *0,10/0,51*	1 *0,11*

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1) These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZXRT19,05ARXTTCP33RP01
XRT4,83PPCP109

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[1]	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[2]	Sealed
PP[2]	Shielded

Material and surface treatment of inner ring

	Material	Surface treatment
No code	440C	–
CP6	440C	Chromium plated sphere
CP109	440C	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55	440C	Passivated inner ring
CP33	PH13-8Mo	–
CP194	PH13-8Mo	Chromium plated sphere
CP195	PH13-8Mo	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP196	PH13-8Mo	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

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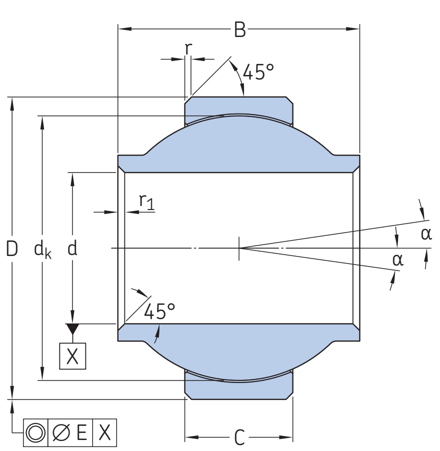
[1] Only available for d ≥ 6

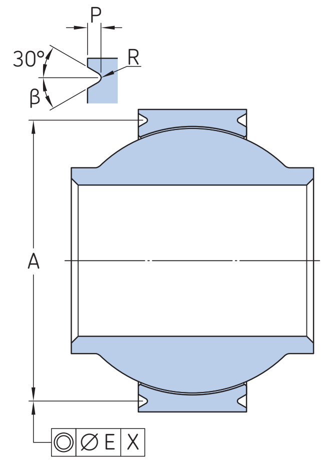
[2] Only available for d ≥ 7,94

2.33 Self-lubricating high misalignment (inch dimensions)

XRT.. bore code **15,87** to **31,75**



XRT



XRT..R

Technical specification	AS 81820
Product standards	SKF
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 *4,826/11,112*	20	0.005 *0,127*
0.5000/1.2500 *12,7/31,75*	30	0.005 *0,127*

Dimensions

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** d Bore without liner 0/–0.0005 *0/–0,0127*	d_a = d with lined bore + 0.0010/0 *+ 0,0250/0*	D 0/–0.0005 *0/–0,0127*	C ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	d_k ≈	d_1 ≈	r_1 +0.012/0 *+0,3/0*	r +0.015/0 *+0,381/0*	A +0.010/0 *+0,254/0*	P 0/–0.010 *0/–0,254*
–		in/*mm*										
15,87	**10**	0.6250 *15,875*	0.6250 *15,875*	1.3750 *34,925*	0.562 *14,275*	1.200 *30,480*	1.240 *31,500*	0.857 *21,768*	0.004 *0,100*	0.020 *0,508*	1.268 *32,200*	0.040 *1,016*
19,05	**12**	0.7500 *19,050*	0.7500 *19,050*	1.5625 *39,688*	0.615 *15,621*	1.280 *32,512*	1.339 *34,000*	0.963 *24,460*	0.004 *0,100*	0.020 *0,508*	1.437 *36,500*	0.060 *1,524*
22,22	**14**	0.8750 *22,225*	0.8750 *22,225*	1.7500 *44,450*	0.620 *15,748*	1.400 *35,560*	1.531 *38,900*	1.122 *28,500*	0.004 *0,100*	0.020 *0,508*	1.624 *41,250*	0.060 *1,524*
25,4	**16**	1.0000 *25,400*	1.0000 *25,400*	2.1250 *53,975*	0.830 *21,082*	1.875 *47,625*	1.875 *47,625*	1.272 *32,309*	0.004 *0,100*	0.020 *0,508*	2.003 *50,876*	0.060 *1,524*
31,75	**20**	1.2500 *31,750*	1.2500 *31,750*	2.5000 *63,500*	1.000 *25,400*	1.875 *47,625*	2.250 *57,150*	1.523 *38,684*	0.004 *0,100*	0.020 *0,508*	2.370 *60,200*	0.060 *1,524*

Dimensions cont., loads and torque

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** R	α	**Mass** ≈	**Static limit loads** Radial C_s	Axial C_a1)	**Radial dynamic load** C25	**Starting torque** Standard	Reduced Max
–		in/*mm*	°	lb/*g*	lbf/*kN*			lbf-in/*Nm*	
15,87	**10**	0.010/0.020 *0,254/0,508*	20	0.25 *114*	34 080 *151,6*	5 553 *24,70*	13 622 *60,6*	1/6.2 *0,11/0,70*	1 *0,11*
19,05	**12**	0.010/0.020 *0,254/0,508*	19	0.32 *145*	51 457 *228,9*	6 362 *28,3*	20 592 *91,6*	1/6.2 *0,11/0,70*	1 *0,11*
22,22	**14**	0.010/0.020 *0,254/0,508*	19	0.43 *195*	61 708 *274,5*	6 452 *28,70*	24 683 *109,8*	2.2/9 *0,25/1,02*	2 *0,23*
25,4	**16**	0.010/0.020 *0,254/0,508*	21	0.81 *367*	84 053 *373,9*	12 206 *54,3*	33 608 *149,50*	2.2/9 *0,25/1,02*	2 *0,23*
31,75	**20**	0.010/0.020 *0,254/0,508*	21	1.11 *504*	119 301 *530,70*	19 355 *86,10*	47 703 *212,2*	3.5/16 *0,395/1,808*	2.2 *0,25*

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1) These values can be limited by the unstaking load (contact SKF for more information)

Designation system

Examples: ZXRT19,05ARXTTCP33RP01
XRT4,83PPCP109

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
A1)	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
TT2)	Sealed
PP2)	Shielded

Material and surface treatment of inner ring

	Material	**Surface treatment**
No code	440C	–
CP6	440C	Chromium plated sphere
CP109	440C	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55	440C	Passivated inner ring
CP33	PH13-8Mo	–
CP194	PH13-8Mo	Chromium plated sphere
CP195	PH13-8Mo	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP196	PH13-8Mo	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

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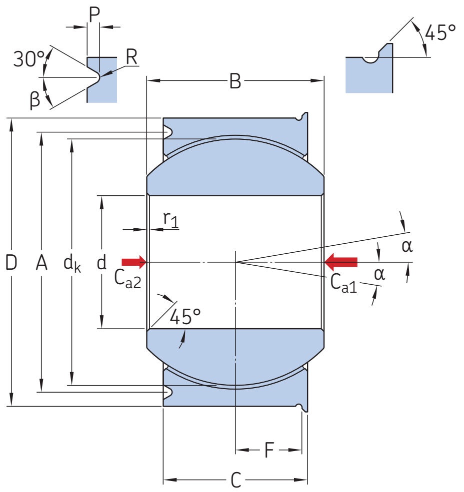
1) Only available for d ≥ 6
2) Only available for d ≥ 7,94

2.34 Self-lubricating pre-staked (inch dimensions)

XRL..FR bore code **6,35** to **12,7**



XRL..FR

Technical specification	AS 81820
Product standards	SKF
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C or PH13.8
Outer ring	Corrosion-resistant steel 17-4PH

d	**β**
in/*mm*	°
0.2500 *6,35*	20
≥ 0.3125 ≥ *7,937*	30

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d Bore without liner 0/–0.0005 *0/–0,0127*	d_a = d with lined bore +0.0010/0 *+0,0250/0*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	r_1 ± 0.005 *± 0,127*	A 0/–0.010 *0/–0,254*	P 0/–0.010 *0/–0,254*	R +0.007/0 *+0,178/0*
–		in/*mm*									
6,35	**4**	0.2500 *6,350*	0.2500 *6,350*	0.6250 *15,875*	0.327 *8,306*	0.437 *11,100*	0.391 *9,919*	0.010 *0,254*	0.563 *14,300*	0.025 *0,635*	0.005 *0,127*
7,94	**5**	0.3125 *7,937*	0.3125 *7,937*	0.6875 *17,462*	0.317 *8,052*	0.437 *11,100*	0.477 *12,109*	0.010 *0,254*	0.625 *15,875*	0.025 *0,635*	0.005 *0,127*
9,52	**6**	0.3750 *9,525*	0.3750 *9,525*	0.8125 *20,637*	0.406 *10,312*	0.500 *12,700*	0.598 *15,193*	0.010 *0,254*	0.712 *18,085*	0.035 *0,889*	0.010 *0,254*
11,11	**7**	0.4375 *11,112*	0.4375 *11,112*	0.9375 *23,812*	0.442 *11,227*	0.562 *14,275*	0.693 *17,594*	0.010 *0,254*	0.837 *21,260*	0.035 *0,889*	0.010 *0,254*
12,7	**8**	0.5000 *12,700*	0.5000 *12,700*	1.0000 *25,400*	0.505 *12,827*	0.625 *15,875*	0.786 *19,975*	0.010 *0,254*	0.900 *22,860*	0.035 *0,889*	0.010 *0,254*

Dimensions, loads and torque

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions F +0.004/0 *+0,102/0*	α	Mass ≈	Static limit loads Axial C_{a1}	 C_{a2}	 Radial C_s	Radial dynamic load C25	Starting torque Standard	 Reduced max
–		in/*mm*	°	lb/*g*	lbf/*kN*				lbf-in/*Nm*	
6,35	**4**	0.146 *3,71*	15	0.03 *14*	1 770 *7,88*	900 *4,0*	5 500 *24,47*	4 900 *21,80*	1/5 *0,11/0,56*	0,5 *0,06*
7,94	**5**	0.142 *3,61*	14	0.035 *16*	1 640 *7,30*	1 115 *4,96*	9 400 *41,83*	6 050 *26,88*	1/5 *0,11/0,56*	1 *0,11*
9,52	**6**	0.177 *4,50*	8	0.06 *27*	2 630 *11,70*	2 318 *10,31*	13 700 *60,96*	8 310 *36,98*	1/5 *0,11/0,56*	1 *0,11*
11,11	**7**	0.195 *4,95*	10	0.08 *38*	3 650 *16,24*	2 893 *12,87*	20 700 *92,11*	11 750 *52,29*	1/5 *0,11/0,56*	1 *0,11*
12,7	**8**	0.226 *5,74*	9	0.1 *45*	4 970 *22,12*	4 000 *17,79*	21 400 *95,23*	14 950 *66,53*	1/5 *0,11/0,56*	1 *0,11*

Designation system

Examples:	ZXRL19,05FRAXTTCP33RP01 XRL9,52FRPPCP109	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[1]	Lined bore

Starting torque

No code	Standard
X	Reduced

Shield and seal

No code	No shield and seal
TT[1]	Sealed
PP[1]	Shielded

Material and surface treatment of inner ring

	Material	Surface treatment
No code	440C	Not plated
CP6	440C	Chromium plated sphere
CP109	440C	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55	440C	Passivated inner ring
CP33	PH13.8	Not plated
CP194	PH13.8	Chromium plated sphere
CP195	PH13.8	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP196	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

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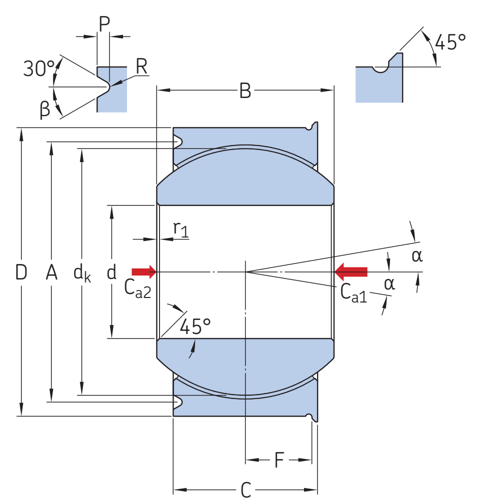
[1] Only available for d ≥ 7,94

2.34 Self-lubricating pre-staked (inch dimensions)

XRL..FR bore code **14,29** to **25,4**



XRL..FR

Technical specification	AS 81820
Product standards	SKF
Materials	
Liner	X1
Inner ring	Corrosion-resistant steel 440C or PH13.8
Outer ring	Corrosion-resistant steel 17-4PH

d	β
in/*mm*	°
0.2500 *6,35*	20
≥ 0.3125 *≥ 7,937*	30

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d Bore without liner 0/–0.0005 *0/–0,0127*	d_a = d with lined bore +0.0010/0 *+0,0250/0*	D 0/–0.0005 *0/–0,0127*	C ±0.005 *±0,127*	B 0/–0.002 *0/–0,051*	d_k ≈	r_1 ± 0.005 *± 0,127*	A 0/–0.010 *0/–0,254*	P 0/–0.010 *0/–0,254*	R +0.007/0 *+0,178/0*
–		in/*mm*									
14,29	**9**	0.5625	0.5625	1.1250	0.536	0.687	0.914	0.010	1.025	0.035	0.010
		14,288	*14,288*	*28,575*	*13,614*	*17,450*	*23,227*	*0,254*	*26,035*	*0,889*	*0,254*
15,87	**10**	0.6250	0.6250	1.1875	0.567	0.750	0.974	0.010	1.087	0.035	0.010
		15,875	*15,875*	*30,162*	*14,400*	*19,050*	*24,739*	*0,254*	*27,610*	*0,889*	*0,254*
19,05	**12**	0.7500	0.7500	1.3750	0.630	0.875	1.130	0.010	1.251	0.055	0.010
		19,050	*19,050*	*34,925*	*16,002*	*22,225*	*28,698*	*0,254*	*31,775*	*1,397*	*0,254*
22,22	**14**	0.8750	0.8750	1.6250	0.755	0.875	1.325	0.010	1.501	0.055	0.010
		22,225	*22,225*	*41,275*	*19,177*	*22,225*	*33,655*	*0,254*	*38,125*	*1,397*	*0,254*
25,4	**16**	1.0000	1.0000	2.1250	1.005	1.375	1.616	0.010	2.001	0.055	0.010
		25,400	*25,400*	*53,975*	*25,527*	*34,925*	*41,038*	*0,254*	*50,825*	*1,397*	*0,254*

Dimensions, loads and torque

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions F +0.004/0 *+0,102/0*	α	Mass ≈	Static limit loads Axial C_{a1}	C_{a2}	Radial C_s	Radial dynamic load C25	Starting torque Standard	Reduced max
–		in/*mm*	°	lb/*g*	lbf/*kN*				lbf-in/*Nm*	
14,29	**9**	0.242	10	0.14	5 370	4 678	26 600	18 100	1/5	1
		6,15		*61*	*23,90*	*20,81*	*118,37*	*80,54*	*0,11/0,56*	*0,11*
15,87	**10**	0.258	12	0.16	6 130	6 130	29 000	20 250	1/5	1
		6,55		*73*	*27,28*	*27,28*	*129,00*	*90,11*	*0,11/0,56*	*0,11*
19,05	**12**	0.27	13	0.24	7 730	6 700	37 000	26 200	1/5	1
		6,86		*109*	*34,40*	*29,80*	*164,65*	*116,59*	*0,11/0,56*	*0,11*
22,22	**14**	0.333	6	0.35	10 800	8 150	65 200	33 600	2/8	2
		8,46		*159*	*48,06*	*36,25*	*290,14*	*149,52*	*0,23/0,9*	*0,23*
25,4	**16**	0.457	12	0.97	19 300	11 198	104 000	56 250	2/8	2
		11,61		*440*	*85,88*	*49,81*	*462,80*	*250,31*	*0,23/0,9*	*0,23*

Designation system

Examples: ZXRL19,05FRAXTTCP33RP01
XRL9,52FRPPCP109

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[1]	Lined bore

Starting torque

No code	Standard
X	Reduced

Shield and seal

No code	No shield and seal
TT[1]	Sealed
PP[1]	Shielded

Material and surface treatment of inner ring

	Material	Surface treatment
No code	440C	Not plated
CP6	440C	Chromium plated sphere
CP109	440C	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP55	440C	Passivated inner ring
CP33	PH13.8	Not plated
CP194	PH13.8	Chromium plated sphere
CP195	PH13.8	XCR plating on sphere (chromium 6 free replacement to chromium plating)
CP196	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

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[1] Only available for d ≥ 7,94

Cross-reference

Metal-to-metal spherical plain bearings

Metric bearings

EN part number	SKF designation
EN2335BP**d’**FR	WMAS**d**RX-2
EN2335BP**d’**FR1	WMAS**d**PRX-2
EN2335BP**d’**GR	WMAC**d**RX-2
EN2335BP**d’**GR1	WMAC**d**PRX-2
EN2335BP**d’**ER	WMA**d**RX-2
EN2335BP**d’**ER1	WMA**d**PRX-2
EN2335AP**d’**FR	WMAS**d**RX
EN2335AP**d’**FR1	WMAS**d**PRX
EN2335AP**d’**GR	WMAC**d**RX
EN2335AP**d’**GR1	WMAC**d**PRX
EN2335AP**d’**ER	WMA**d**RX
EN2335AP**d’**ER1	WMA**d**PRX
EN2335BP**d’**FS	WMAS**d**X-2
EN2335BP**d’**GS	WMAC**d**X-2
EN2335BP**d’**ES	WMA**d**X-2
EN2335AP**d’**FS	WMAS**d**X
EN2335AP**d’**GS	WMAC**d**X
EN2335AP**d’**ES	WMA**d**X
EN2335BN**d’**FR	WMAS**d**R-2
EN2335BN**d’**FR1	WMAS**d**PR-2
EN2335BN**d’**GR	WMAC**d**R-2
EN2335BN**d’**GR1	WMAC**d**PR-2
EN2335BN**d’**ER	WMA**d**R-2
EN2335BN**d’**ER1	WMA**d**PR-2
EN2335AN**d’**FR	WMAS**d**R
EN2335AN**d’**FR1	WMAS**d**PR
EN2335AN**d’**GR	WMAC**d**R
EN2335AN**d’**GR1	WMAC**d**PR
EN2335AN**d’**ER	WMA**d**R
EN2335AN**d’**ER1	WMA**d**PR
EN2335BN**d’**FS	WMAS**d**-2
EN2335BN**d’**GS	WMAC**d**-2
EN2335BN**d’**ES	WMA**d**-2
EN2335AN**d’**FS	WMAS**d**
EN2335AN**d’**GS	WMAC**d**
EN2335AN**d’**ES	WMA**d**
EN2335BP**d’**FRT	WMAS**d**RX-2CP55
EN2335BP**d’**FRT1	WMAS**d**PRX-2CP55
EN2335BP**d’**GRT	WMAC**d**RX-2CP55
EN2335BP**d’**GRT1	WMAC**d**PRX-2CP55
EN2335BP**d’**ERT	WMA**d**RX-2CP55
EN2335BP**d’**ERT1	WMA**d**PRX-2CP55
EN2335AP**d’**FRT	WMAS**d**RXCP55
EN2335AP**d’**FRT1	WMAS**d**PRXCP55
EN2335AP**d’**GRT	WMAC**d**RXCP55
EN2335AP**d’**GRT1	WMAC**d**PRXCP55
EN2335AP**d’**ERT	WMA**d**RXCP55
EN2335AP**d’**ERT1	WMA**d**PRXCP55
EN2335BP**d’**FST	WMAS**d**X-2CP55
EN2335BP**d’**GST	WMAC**d**X-2CP55
EN2335BP**d’**EST	WMA**d**X-2CP55
EN2335AP**d’**FST	WMAS**d**XCP55
EN2335AP**d’**GST	WMAC**d**XCP55
EN2335AP**d’**EST	WMA**d**XCP55
EN2335BN**d’**FRT	WMAS**d**R-2CP55
EN2335BN**d’**FRT1	WMAS**d**PR-2CP55
EN2335BN**d’**GRT	WMAC**d**R-2CP55
EN2335BN**d’**GRT1	WMAC**d**PR-2CP55
EN2335BN**d’**ERT	WMA**d**R-2CP55
EN2335BN**d’**ERT1	WMA**d**PR-2CP55
EN2335AN**d’**FRT	WMAS**d**RCP55
EN2335AN**d’**FRT1	WMAS**d**PRCP55
EN2335AN**d’**GRT	WMAC**d**RCP55
EN2335AN**d’**GRT1	WMAC**d**PRCP55
EN2335AN**d’**ERT	WMA**d**RCP55
EN2335AN**d’**ERT1	WMA**d**PRCP55
EN2335BN**d’**FST	WMAS**d**-2CP55
EN2335BN**d’**GST	WMAC**d**-2CP55
EN2335BN**d’**EST	WMA**d**-2CP55
EN2335AN**d’**FST	WMAS**d**CP55
EN2335AN**d’**GST	WMAC**d**CP55
EN2335AN**d’**EST	WMA**d**CP55

Where
d = Bore code
d’ = 0d for d ≤ 8
d for d ≥ 10

Example

EN part number	SKF designation
EN2335BP**20**FR	WMAS**20**RX-2
EN2335AN**06**GRT1	WMAC**6**PRCP55

EN part number	SKF designation
EN2336AP**d'**E	GE**d**DC3A
EN2336AP**d'**F	GE**d**DSC3A
EN2336AP**d'**G	GE**d**DCC3A
EN2336AN**d'**E	GE**d**DC2A
EN2336AN**d'**F	GE**d**DSC2A
EN2336AN**d'**G	GE**d**DCC2A
EN2336BP**d'**E	GE**d**DC3A-2
EN2336BP**d'**F	GE**d**DSC3A-2
EN2336BP**d'**G	GE**d**DCC3A-2
EN2336BN**d'**E	GE**d**DC2A-2
EN2336BN**d'**F	GE**d**DSC2A-2
EN2336BN**d'**G	GE**d**DCC2A-2
EN2588AP**d'**E	WGE**d**DC3A
EN2588AP**d'**F	WGE**d**DSC3A
EN2588AP**d'**G	WGE**d**DCC3A
EN2588AN**d'**E	WGE**d**DC2A
EN2588AN**d'**F	WGE**d**DSC2A
EN2588AN**d'**G	WGE**d**DCC2A
EN2588BP**d'**E	WGE**d**DC3A-2
EN2588BP**d'**F	WGE**d**DSC3A-2
EN2588BP**d'**G	WGE**d**DCC3A-2
EN2588BN**d'**E	WGE**d**DC2A-2
EN2588BN**d'**F	WGE**d**DSC2A-2
EN2588BN**d'**G	WGE**d**DCC2A-2
EN2588AP**d'**ET	WGE**d**DC3ACP55
EN2588AP**d'**FT	WGE**d**DSC3A CP55
EN2588AP**d'**GT	WGE**d**DCC3A CP55
EN2588AN**d'**ET	WGE**d**DC2A CP55
EN2588AN**d'**FT	WGE**d**DSC2A CP55
EN2588AN**d'**GT	WGE**d**DCC2A CP55
EN2588BP**d'**ET	WGE**d**DC3A-2 CP55
EN2588BP**d'**FT	WGE**d**DSC3A-2 CP55
EN2588BP**d'**GT	WGE**d**DCC3A-2 CP55

EN part number	SKF designation
EN2588BN**d'**ET	WGE**d**DC2A-2 CP55
EN2588BN**d'**FT	WGE**d**DSC2A-2 CP55
EN2588BN**d'**GT	WGE**d**DCC2A-2 CP55

Where
d = Bore code
d' = 0d for d ≤ 8
d for d ≥ 10

Example

EN part number	SKF designation
EN2336AP**05**G	GE**5**DCC3A
EN2588BN**40**FT	WGE**40**DSC2A-2CP55

Inch bearings

EN part number	SKF designation
EN6046BNd’ERZ	ZENEdR-2
EN6046BNd’FRZ	ZENESdR-2
EN6046BNd’GRZ	ZENECdR-2
EN6046BPd’ERZ	ZENEdRX-2
EN6046BPd’FRZ	ZENESdRX-2
EN6046BPd’GRZ	ZENECdRX-2
EN6046ANd’ERZ	ZENEdR
EN6046ANd’FRZ	ZENESdR
EN6046ANd’GRZ	ZENECdR
EN6046APd’ERZ	ZENEdRX
EN6046APd’FRZ	ZENESdRX
EN6046APd’GRZ	ZENECdRX
EN6046BNd’ESZ	ZENEd-2
EN6046BNd’FSZ	ZENESd-2
EN6046BNd’GSZ	ZENECd-2
EN6046BPd’ESZ	ZENEdX-2
EN6046BPd’FSZ	ZENESdX-2
EN6046BPd’GSZ	ZENECdX-2
EN6046ANd’ESZ	ZENEd
EN6046ANd’FSZ	ZENESd
EN6046ANd’GSZ	ZENECd
EN6046APd’ESZ	ZENEdX
EN6046APd’FSZ	ZENESdX
EN6046APd’GSZ	ZENECdX
EN6046BNd’ER	ENEdR-2
EN6046BNd’FR	ENESdR-2
EN6046BNd’GR	ENECdR-2
EN6046BPd’ER	ENEdRX-2
EN6046BPd’FR	ENESdRX-2
EN6046BPd’GR	ENECdRX-2
EN6046ANd’ER	ENEdR
EN6046ANd’FR	ENESdR
EN6046ANd’GR	ENECdR
EN6046APd’ER	ENEdRX
EN6046APd’FR	ENESdRX
EN6046APd’GR	ENECdRX
EN6046BNd’ES	ENEd-2
EN6046BNd’FS	ENESd-2
EN6046BNd’GS	ENECd-2

EN part number	SKF designation
EN6046BPd’ES	ENEdX-2
EN6046BPd’FS	ENESdX-2
EN6046BPd’GS	ENECdX-2
EN6046ANd’ES	ENEd
EN6046ANd’FS	ENESd
EN6046ANd’GS	ENECd
EN6046APd’ES	ENEdX
EN6046APd’FS	ENESdX
EN6046APd’GS	ENECdX

Where
d = Bore code
d' = dash number (multiples of 1/16 inch)

Example

EN part number	SKF designation
EN6046BN06FRZ	ZENES9,52R-2
EN6046BP14GS	ENEC22,22X-2

EN part number	SKF designation
EN4265BPdER	ENLdX-2R
EN4265BPd’FR	ENLSdX-2R
EN4265BPd’GR	ENLCdX-2R
EN4265APd’ER	ENLdXR
EN4265APd’FR	ENLSdXR
EN4265APd’GR	ENLCdXR
EN4265BNd’ER	ENLd-2R
EN4265NPd’FR	ENLSd-2R
EN4265NPd’GR	ENLCd-2R
EN4265ANd’ER	ENLdR
EN4265ANd’FR	ENLSdR
EN4265ANd’GR	ENLCdR
EN4265BPd’ES	ENLdX-2
EN4265BPd’FS	ENLSdX-2
EN4265BPd’GS	ENLCdX-2
EN4265APd’ES	ENLdX
EN4265APd’FS	ENLSdX
EN4265APd’GS	ENLCdX

EN part number	SKF designation
EN4265BN**d’**ES	ENL**d**-2
EN4265NP**d’**FS	ENLS**d**-2
EN4265NP**d’**GS	ENLC**d**-2
EN4265AN**d’**ES	ENL**d**
EN4265AN**d’**FS	ENLS**d**
EN4265AN**d’**GS	ENLC**d**
EN4266BP**d’**ER	ZENL**d**X-2R
EN4266BP**d’**FR	ZENLS**d**X-2R
EN4266BP**d’**GR	ZENLC**d**X-2R
EN4266AP**d’**ER	ZENL**d**XR
EN4266AP**d’**FR	ZENLS**d**XR
EN4266AP**d’**GR	ZENLC**d**XR
EN4266BN**d’**ER	ZENL**d**-2R
EN4266NP**d’**FR	ZENLS**d**-2R
EN4266NP**d’**GR	ZENLC**d**-2R
EN4266AN**d’**ER	ZENL**d**R
EN4266AN**d’**FR	ZENLS**d**R
EN4266AN**d’**GR	ZENLC**d**R
EN4266BP**d’**ES	ZENL**d**X-2
EN4266BP**d’**FS	ZENLS**d**X-2
EN4266BP**d’**GS	ZENLC**d**X-2
EN4266AP**d’**ES	ZENL**d**X
EN4266AP**d’**FS	ZENLS**d**X
EN4266AP**d’**GS	ZENLC**d**X
EN4266BN**d’**ES	ZENL**d**-2
EN4266NP**d’**FS	ZENLS**d**-2
EN4266NP**d’**GS	ZENLC**d**-2
EN4266AN**d’**ES	ZENL**d**
EN4266AN**d’**FS	ZENLS**d**
EN4266AN**d’**GS	ZENLC**d**

Where
d = Bore code
d' = dash number (multiples of 1/16 inch)

Example

EN part number	SKF designation
EN4265BP**07**FR	ENLS**11,11**X-2R
EN4266AN**12**GS	ZENLC**19,05**

AS part number	SKF designation
M81936/1-**d’**RT	QXMBC**d**RRP01
M81936/1-**d’**RU	QXMBC**d**RRP02
M81936/1-**d’**R	QXMBC**d**R
M81936/1-**d’**T	QXMBY**d**RRP01
M81936/1-**d’**U	QXMBY**d**RRP02
M81936/1-**d’**	QXMBY**d**R
M81936/2-**d’**RT	QXMBC**d**RP01
M81936/2-**d’**RU	QXMBC**d**RP02
M81936/2-**d’**R	QXMBC**d**
M81936/2-**d’**T	QXMBY**d**RP01
M81936/2-**d’**U	QXMBY**d**RP02
M81936/2-**d’**	QXMBY**d**

Where
d = Bore code
d' = dash number (multiples of 1/16 inch)

Example

AS part number	SKF designation
M81936/1-**4**RT	QXMBC**6,35**RRP01
M81936/2-**12**	QXMBY**19,05**

AS part number	SKF designation
MS21154S**d’**E	SZWMEY**d**RX-3
MS21154S**d’**	ZWMEY**d**RX-3
MS21154B**d’**E	SZWQMEY**d**RX-3
MS21154B**d’**	ZWQMEY**d**RX-3
MS21155S**d’**E	SZWMEY**d**X-3
MS21155S**d’**	ZWMEY**d**X-3
MS21155B**d’**E	SZWQMEY**d**X-3
MS21155B**d’**	ZWQMEY**d**X-3

Where
d = Bore code
d' = dash number (multiples of 1/16 inch)

Example

AS part number	SKF designation
MS21154S**03**E	SZWMEY**4,83**RX-3
MS21155B**14**	ZWQMEY**22,2**2X-3

Self-lubricating spherical plain bearings

Metric bearings

EN part number	SKF designation
EN3048S**d**PA1)	LEN**d**F
EN3048S**d**TA1)	LEN**d**V
EN3048S**d**A1)	LEN**d**
EN3048R**d**PA1)	LEN**d**RF
EN3048R**d**TA1)	LEN**d**RV
EN3048R**d**A1)	LEN**d**R
EN3048R**d**PA11)	LEN**d**PRF
EN3048R**d**TA11)	LEN**d**PRV
EN3048R**d**A11)	LEN**d**PR
EN 4037S**d**T1)	LEN**d**XV
EN 4037S**d**1)	LEN**d**X
EN 4037R**d**T1)	LEN**d**RXV
EN 4037R**d**1)	LEN**d**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
EN3048R17TA1	LEN17/30PRV
EN3048R17A1	LEN17/30PR
EN 4037S17T	LEN17/30XV
EN 4037S17	LEN17/30X
EN 4037R17T	LEN17/30RXV
EN 4037R17	LEN17/30RX

Where
d = Bore code

Example

EN part number	SKF designation
EN3048S**12**PA	LEN**12**F
EN3048R**15**TA1	LEN**15**/26PRV
EN 4037R**35**	LEN**35**RX

EN part number	SKF designation
EN2584S**d’**PA	NEN**d**F
EN2584S**d’**TA	NEN**d**V
EN2584S**d’**A	NEN**d**
EN2584R**d’**PA	NEN**d**RF
EN2584R**d’**TA	NEN**d**RV
EN2584R**d’**A	NEN**d**R
EN 4038S**d’**T	NEN**d**XV
EN 4038S**d’**	NEN**d**X
EN 4038R**d’**T	NEN**d**RXV
EN 4038R**d’**	NEN**d**RX

Where
d = Bore code
d’ = 0d for d ≤ 8
d for d ≥ 10

Example

EN part number	SKF designation
EN2584S**05**PA	NEN**5**F
EN 4038S**12**	NEN**12**X

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1) Except d = 15 and d = 17.

EN part number	SKF designation
EN2585Sd'PA	WENdF
EN2585Sd'TA	WENdV
EN2585Sd'A	WENd
EN2585Rd'PA	WENdRF
EN2585Rd'TA	WENdRV
EN2585Rd'A	WENdR
EN 4039Sd'T	WENdXV (or d ≥ 6 and d ≤ 50)
EN 4039Sd'	WENdX (For d ≥ 6 and d ≤ 50)
EN 4039Rd'T	WENdRXV (For d ≥ 6 and d ≤ 50)
EN 4039Rd'	WENdRX (For d ≥ 6 and d ≤ 50)

Where
d = Bore code
d' = 0d for d ≤ 8
d for d ≥ 10

Example

EN part number	SKF designation
EN2585S05PA	WEN5F
EN 4039R20	WEN20RX

EN part number	SKF designation
EN4040Sd'TN	HMENdV
EN4040Sd'TL	HMENdXV
EN4040Sd'N	HMENd
EN4040Sd'L	HMENdX
EN4040Rd'TN	HMENdRV
EN4040Rd'TL	HMENdRXV
EN4040Rd'N	HMENdR
EN4040Rd'L	HMENdRX

Where
d = Bore code
d' = 06 for bore code 6B
08 for bore code 8B
10 for bore code 10B

Example

EN part number	SKF designation
EN4040S06TN	HMEN6BV

Inch bearings

AS part number		SKF designation	
MS14101-**5**ACEKT for d= 5	MS14101-**d**CEKT1)	SZENAS**d**RXY2	
MS14101-**5**ACEKU for d= 5	MS14101-**d**CEKU1)	SZENAS**d**RXY4	
MS14101-**5**ACEK for d= 5	MS14101-**d**CEK1)	SZENAS**d**RX	
MS14101-**5**ACET for d= 5	MS14101-**d**CET1)	SZENAS**d**RY2	
MS14101-**5**ACEU for d= 5	MS14101-**d**CEU1)	SZENAS**d**RY4	
MS14101-**5**ACE for d= 5	MS14101-**d**CE1)	SZENAS**d**R	
MS14101-**5**ACKT for d= 5	MS14101-**d**CKT1)	ENAS**d**RXY2	
MS14101-**5**ACKU for d= 5	MS14101-**d**CKU1)	ENAS**d**RXY4	
MS14101-**5**ACK for d= 5	MS14101-**d**CK1)	ENAS**d**RX	
MS14101-**5**ACT for d= 5	MS14101-**d**CT1)	ENAS**d**RY2	
MS14101-**5**ACU for d= 5	MS14101-**d**CU1)	ENAS**d**RY4	
MS14101-**5**AC for d= 5	MS14101-**d**C1)	ENAS**d**R	
MS14101-**5**ACPKT for d= 5	MS14101-**d**CPKT1)	ZENAS**d**RXY2	SZENAS**d**RXY2
MS14101-**5**ACPKU for d= 5	MS14101-**d**CPKU1)	ZENAS**d**RXY4	SZENAS**d**RXY4
MS14101-**5**ACPK for d= 5	MS14101-**d**CPK1)	ZENAS**d**RX	SZENAS**d**RX
MS14101-**5**ACPT for d= 5	MS14101-**d**CPT1)	ZENAS**d**RY2	SZENAS**d**RY2
MS14101-**5**ACPU for d= 5	MS14101-**d**CPU1)	ZENAS**d**RY4	SZENAS**d**RY4
MS14101-**5**ACP for d= 5	MS14101-**d**CP1)	ZENAS**d**R	SZENAS**d**R
MS14101-**5**AEKT for d= 5	MS14101-**d**EKT1)	SZNAS**d**RXY2	
MS14101-**5**AEKU for d= 5	MS14101-**d**EKU1)	SZNAS**d**RXY4	
MS14101-**5**AEK for d= 5	MS14101-**d**EK1)	SZNAS**d**RX	
MS14101-**5**AET for d= 5	MS14101-**d**ET1)	SZNAS**d**RY2	
MS14101-**5**AEU for d= 5	MS14101-**d**EU1)	SZNAS**d**RY4	
MS14101-**5**AE for d= 5	MS14101-**d**E1)	SZNAS**d**R	
MS14101-**5**AKT for d= 5	MS14101-**d**KT1)	NAS**d**RXY2	
MS14101-**5**AKU for d= 5	MS14101-**d**KU1)	NAS**d**RXY4	
MS14101-**5**AK for d= 5	MS14101-**d**K1)	NAS**d**RX	
MS14101-**5**AT for d= 5	MS14101-**d**T1)	NAS**d**RY2	
MS14101-**5**AU for d= 5	MS14101-**d**U1)	NAS**d**RY4	
MS14101-**5**A for d= 5	MS14101-**d**1)	NAS**d**R	
MS14101-**5**APKT for d= 5	MS14101-**d**PKT1)	ZNAS**d**RXY2	SZNAS**d**RXY2
MS14101-**5**APKU for d= 5	MS14101-**d**PKU1)	ZNAS**d**RXY4	SZNAS**d**RXY4
MS14101-**5**APK for d= 5	MS14101-**d**PK1)	ZNAS**d**RX	SZNAS**d**RX
MS14101-**5**APT for d= 5	MS14101-**d**PT1)	ZNAS**d**RY2	SZNAS**d**RY2
MS14101-**5**APU for d= 5	MS14101-**d**PU1)	ZNAS**d**RY4	SZNAS**d**RY4
MS14101-**5**AP for d= 5	MS14101-**d**P1)	ZNAS**d**R	SZNAS**d**R
MS14104-**d**CEKT		SZENAS**d**XY2	
MS14104-**d**CEKU		SZENAS**d**XY4	
MS14104-**d**CEK		SZENAS**d**X	
MS14104-**d**CET		SZENAS**d**Y2	
MS14104-**d**CEU		SZENAS**d**Y4	
MS14104-**d**CE		SZENAS**d**	

AS part number	SKF designation	
MS14104-**d**CKT	ENAS**d**XY2	
MS14104-**d**CKU	ENAS**d**XY4	
MS14104-**d**CK	ENAS**d**X	
MS14104-**d**CT	ENAS**d**Y2	
MS14104-**d**CU	ENAS**d**Y4	
MS14104-**d**C	ENAS**d**	
MS14104-**d**CPKT	ZENAS**d**XY2	SZENAS**d**XY2
MS14104-**d**CPKU	ZENAS**d**XY4	SZENAS**d**XY4
MS14104-**d**CPK	ZENAS**d**X	SZENAS**d**X
MS14104-**d**CPT	ZENAS**d**Y2	SZENAS**d**Y2
MS14104-**d**CPU	ZENAS**d**Y4	SZENAS**d**Y4
MS14104-**d**CP	ZENAS**d**	SZENAS**d**
MS14104-**d**EKT	SZNAS**d**XY2	
MS14104-**d**EKU	SZNAS**d**XY4	
MS14104-**d**EK	SZNAS**d**X	
MS14104-**d**ET	SZNAS**d**Y2	
MS14104-**d**EU	SZNAS**d**Y4	
MS14104-**d**E	SZNAS**d**	
MS14104-**d**KT	NAS**d**XY2	
MS14104-**d**KU	NAS**d**XY4	
MS14104-**d**K	NAS**d**X	
MS14104-**d**T	NAS**d**Y2	
MS14104-**d**U	NAS**d**Y4	
MS14104-**d**	NAS**d**	
MS14104-**d**PKT	ZNAS**d**XY2	SZNAS**d**XY2
MS14104-**d**PKU	ZNAS**d**XY4	SZNAS**d**XY4
MS14104-**d**PK	ZNAS**d**X	SZNAS**d**X
MS14104-**d**PT	ZNAS**d**Y2	SZNAS**d**Y2
MS14104-**d**PU	ZNAS**d**Y4	SZNAS**d**Y4
MS14104-**d**P	ZNAS**d**	SZNAS**d**

Where
d = Nominal bore code, with d ≤ 16
[1] Except for d = 5

Example

AS part number	SKF designation	
MS14101- 3CEKT	SZENAS 3RXY2	
MS14101-10PK	ZNAS10RX	SZNAS10RX
MS14104- 6KU	NAS 6XY4	
MS14104-12P	ZNAS12	SZNAS12

AS part number	SKF designation	
MS14103-dCEKT	SZEWASdRXY2	
MS14103-dCEKU	SZEWASdRXY4	
MS14103-dCEK	SZEWASdRX	
MS14103-dCET	SZEWASdRY2	
MS14103-dCEU	SZEWASdRY4	
MS14103-dCE	SZEWASdR	
MS14103-dCKT	EWASdRXY2	
MS14103-dCKU	EWASdRXY4	
MS14103-dCK	EWASdRX	
MS14103-dCT	EWASdRY2	
MS14103-dCU	EWASdRY4	
MS14103-dC	EWASdR	
MS14103-dCPKT	ZEWASdRXY2	SZEWASdRXY2
MS14103-dCPKU	ZEWASdRXY4	SZEWASdRXY4
MS14103-dCPK	ZEWASdRX	SZEWASdRX
MS14103-dCPT	ZEWASdRY2	SZEWASdRY2
MS14103-dCPU	ZEWASdRY4	SZEWASdRY4
MS14103-dCP	ZEWASdR	SZEWASdR
MS14103-dEKT	SZWASdRXY2	
MS14103-dEKU	SZWASdRXY4	
MS14103-dEK	SZWASdRX	
MS14103-dET	SZWASdRY2	
MS14103-dEU	SZWASdRY4	
MS14103-dE	SZWASdR	
MS14103-dKT	WASdRXY2	
MS14103-dKU	WASdRXY4	
MS14103-dK	WASdRX	
MS14103-dT	WASdRY2	
MS14103-dU	WASdRY4	
MS14103-d	WASdR	
MS14103-dPKT	ZWASdRXY2	SZWASdRXY2
MS14103-dPKU	ZWASdRXY4	SZWASdRXY4
MS14103-dPK	ZWASdRX	SZWASdRX
MS14103-dPT	ZWASdRY2	SZWASdRY2
MS14103-dPU	ZWASdRY4	SZWASdRY4
MS14103-dP	ZWASdR	SZWASdR
MS14102-dCEKT	SZEWASdXY2	
MS14102-d'CEKU	SZEWASdXY4	
MS14102-dCEK	SZEWASdX	
MS14102-dCET	SZEWASdY2	
MS14102-dCEU	SZEWASdY4	
MS14102-dCE	SZEWASd	

AS part number	SKF designation	
MS14102-d'CKT	EWASdXY2	
MS14102-dCKU	EWASdXY4	
MS14102-dCK	EWASdX	
MS14102-dCT	EWASdY2	
MS14102-dCU	EWASdY4	
MS14102-dC	EWASd	
MS14102-dCPKT	ZEWASdXY2	SZEWASdXY2
MS14102-dCPKU	ZEWASdXY4	SZEWASdXY4
MS14102-dCPK	ZEWASdX	SZEWASdX
MS14102-dCPT	ZEWASdY2	SZEWASdY2
MS14102-dCPU	ZEWASdY4	SZEWASdY4
MS14102-dCP	ZEWASd	SZEWASd
MS14102-dEKT	SZWASdXY2	
MS14102-dEKU	SZWASdXY4	
MS14102-dEK	SZWASdX	
MS14102-dET	SZWASdY2	
MS14102-dEU	SZWASdY4	
MS14102-dE	SZWASd	
MS14102-dKT	WASdXY2	
MS14102-dKU	WASdXY4	
MS14102-dK	WASdX	
MS14102-dT	WASdY2	
MS14102-dU	WASdY4	
MS14102-d	WASd	
MS14102-dPKT	ZWASdXY2	SZWASdXY2
MS14102-dPKU	ZWASdXY4	SZWASdXY4
MS14102-dPK	ZWASdX	SZWASdX
MS14102-dPT	ZWASdY2	SZWASdY2
MS14102-dPU	ZWASdY4	SZWASdY4
MS14102-dP	ZWASd	SZWASd

Where
d = Nominal bore code, with d ≤ 16

Example

AS part number	SKF designation	
MS14103- 3CEKT	SZEWAS 3RXY2	
MS14103-10CP	ZEWAS10R	SZEWAS10R
MS14102- 6KU	WAS 6XY4	
MS14102-12P	ZWAS12	SZWAS12

AS part number	SKF designation	
M81820/1-**d**EKT	SZENAS**d**ARXY2	
M81820/1-**d**EKU	SZENAS**d**ARXY4	
M81820/1-**d**EK	SZENAS**d**ARX	
M81820/1-**d**ET	SZENAS**d**ARY2	
M81820/1-**d**EU	SZENAS**d**ARY4	
M81820/1-**d**E	SZENAS**d**AR	
M81820/1-**d**KT	ENAS**d**ARXY2	
M81820/1-**d**KU	ENAS**d**ARXY4	
M81820/1-**d**K	ENAS**d**ARX	
M81820/1-**d**T	ENAS**d**ARY2	
M81820/1-**d**U	ENAS**d**ARY4	
M81820/1-**d**	ENAS**d**AR	
M81820/1-**d**PKT	ZENAS**d**ARXY2	SZENAS**d**ARXY2
M81820/1-**d**PKU	ZENAS**d**ARXY4	SZENAS**d**ARXY4
M81820/1-**d**PK	ZENAS**d**ARX	SZENAS**d**ARX
M81820/1-**d**PT	ZENAS**d**ARY2	SZENAS**d**ARY2
M81820/1-**d**PU	ZENAS**d**ARY4	SZENAS**d**ARY4
M81820/1-**d**P	ZENAS**d**AR	SZENAS**d**AR
M81820/1-**d**EKTD	SZNAS**d**ARXY2	
M81820/1-**d**EKUD	SZNAS**d**ARXY4	
M81820/1-**d**EKD	SZNAS**d**ARX	
M81820/1-**d**ETD	SZNAS**d**ARY2	
M81820/1-**d**EUD	SZNAS**d**ARY4	
M81820/1-**d**ED	SZNAS**d**AR	
M81820/1-**d**KTD	NAS**d**ARXY2	
M81820/1-**d**KUD	NAS**d**ARXY4	
M81820/1-**d**KD	NAS**d**ARX	
M81820/1-**d**TD	NAS**d**ARY2	
M81820/1-**d**UD	NAS**d**ARY4	
M81820/1-**d**D	NAS**d**AR	
M81820/1-**d**PKTD	ZNAS**d**ARXY2	SZNAS**d**ARXY2
M81820/1-**d**PKUD	ZNAS**d**ARXY4	SZNAS**d**ARXY4
M81820/1-**d**PKD	ZNAS**d**ARX	SZNAS**d**ARX
M81820/1-**d**PTD	ZNAS**d**ARY2	SZNAS**d**ARY2
M81820/1-**d**PUD	ZNAS**d**ARY4	SZNAS**d**ARY4
M81820/1-**d**PD	ZNAS**d**AR	SZNAS**d**AR
M81820/4-**d**EKT	SZENAS**d**AXY2	
M81820/4-**d**EKU	SZENAS**d**AXY4	
M81820/4-**d**EK	SZENAS**d**AX	
M81820/4-**d**ET	SZENAS**d**AY2	
M81820/4-**d**EU	SZENAS**d**AY4	
M81820/4-**d**E	SZENAS**d**A	

AS part number	SKF designation	
M81820/4-**d**KT	ENAS**d**AXY2	
M81820/4-**d**KU	ENAS**d**AXY4	
M81820/4-**d**K	ENAS**d**AX	
M81820/4-**d**T	ENAS**d**AY2	
M81820/4-**d**U	ENAS**d**AY4	
M81820/4-**d**	ENAS**d**A	
M81820/4-**d**PKT	ZENAS**d**AXY2	SZENAS**d**AXY2
M81820/4-**d**PKU	ZENAS**d**AXY4	SZENAS**d**AXY4
M81820/4-**d**PK	ZENAS**d**AX	SZENAS**d**AX
M81820/4-**d**PT	ZENASdAY2	SZENAS**d**AY2
M81820/4-**d**PU	ZENASdAY4	SZENAS**d**AY4
M81820/4-**d**P	ZENASdA	SZENAS**d**A
M81820/4-**d**EKTD	SZNAS**d**AXY2	
M81820/4-**d**EKUD	SZNAS**d**AXY4	
M81820/4-**d**EKD	SZNAS**d**AX	
M81820/4-**d**ETD	SZNAS**d**AY2	
M81820/4-**d**EUD	SZNAS**d**AY4	
M81820/4-**d**ED	SZNAS**d**A	
M81820/4-**d**KTD	NAS**d**AXY2	
M81820/4-**d**KUD	NAS**d**AXY4	
M81820/4-**d**KD	NAS**d**AX	
M81820/4-**d**TD	NAS**d**AY2	
M81820/4-**d**UD	NAS**d**AY4	
M81820/4-**d**D	NAS**d**A	
M81820/4-**d**PKTD	ZNAS**d**AXY2	SZNAS**d**AXY2
M81820/4-**d**PKUD	ZNAS**d**AXY4	SZNAS**d**AXY4
M81820/4-**d**PKD	ZNAS**d**AX	SZNAS**d**AX
M81820/4-**d**PTD	ZNAS**d**AY2	SZNAS**d**AY2
M81820/4-**d**PUD	ZNAS**d**AY4	SZNAS**d**AY4
M81820/4-**d**PD	ZNAS**d**A	SZNAS**d**A

Where
d = Nominal bore code, with $4 \leq d \leq 16$

Example

AS part number	SKF designation	
M81820/1- **5**EKT	SZENAS **5**ARXY2	
M81820/1-**10**PK	ZENAS**10**7ARX	SZENAS**10**ARX
M81820/4- **6**UD	NAS **6**AY4	
M81820/4-**12**PD	ZNAS**12**A	SZNAS**12**A

AS part number	SKF designation	
M81820/3-dEKT	SZEWASdARXY2	
M81820/3-dEKU	SZEWASdARXY4	
M81820/3-dEK	SZEWASdARX	
M81820/3-dET	SZEWASdARY2	
M81820/3-dEU	SZEWASdARY4	
M81820/3-dE	SZEWASdAR	
M81820/3-dKT	EWASdARXY2	
M81820/3-dKU	EWASdARXY4	
M81820/3-dK	EWASdARX	
M81820/3-dT	EWASdARY2	
M81820/3-dU	EWASdARY4	
M81820/3-d	EWASdAR	
M81820/3-dPKT	ZEWASdARXY2	SZEWASdARXY2
M81820/3-dPKU	ZEWASdARXY4	SZEWASdARXY4
M81820/3-dPK	ZEWASdARX	SZEWASdARX
M81820/3-dPT	ZEWASdARY2	SZEWASdARY2
M81820/3-dPU	ZEWASdARY4	SZEWASdARY4
M81820/3-dP	ZEWASdAR	SZEWASdAR
M81820/3-dEKTD	SZWASdARXY2	
M81820/3-dEKUD	SZWASdARXY4	
M81820/3-dEKD	SZWASdARX	
M81820/3-dETD	SZWASdARY2	
M81820/3-dEUD	SZWASdARY4	
M81820/3-dED	SZWASdAR	
M81820/3-dKTD	WASdARXY2	
M81820/3-dKUD	WASdARXY4	
M81820/3-dKD	WASdARX	
M81820/3-dTD	WASdARY2	
M81820/3-dUD	WASdARY4	
M81820/3-dD	WASdAR	
M81820/3-dPKTD	ZWASdARXY2	SZWASdARXY2
M81820/3-dPKUD	ZWASdARXY4	SZWASdARXY4
M81820/3-dPKD	ZWASdARX	SZWASdARX
M81820/3-dPTD	ZWASdARY2	SZWASdARY2
M81820/3-dPUD	ZWASdARY4	SZWASdARY4
M81820/3-dPD	ZWASdAR	SZWASdAR
M81820/2-dEKT	SZEWASdAXY2	
M81820/2-dEKU	SZEWASdAXY4	
M81820/2-dEK	SZEWASdAX	
M81820/2-dET	SZEWASdAY2	
M81820/2-dEU	SZEWASdAY4	
M81820/2-dE	SZEWASdA	

AS part number	SKF designation	
M81820/2-dKT	EWASdAXY2	
M81820/2-dKU	EWASdAXY4	
M81820/2-dK	EWASdAX	
M81820/2-dT	EWASdAY2	
M81820/2-dU	EWASdAY4	
M81820/2-d	EWASdA	
M81820/2-dPKT	ZEWASdAXY2	SZEWASdAXY2
M81820/2-dPKU	ZEWASdAXY4	SZEWASdAXY4
M81820/2-dPK	ZEWASdAX	SZEWASdAX
M81820/2-dPT	ZEWASdAY2	SZEWASdAY2
M81820/2-dPU	ZEWASdAY4	SZEWASdAY4
M81820/2-dP	ZEWASdA	SZEWASdA
M81820/2-dEKTD	SZWASdAXY2	
M81820/2-dEKUD	SZWASdAXY4	
M81820/2-dEKD	SZWASdAX	
M81820/2-dETD	SZWASdAY2	
M81820/2-dEUD	SZWASdAY4	
M81820/2-d'ED	SZWASdA	
M81820/2-dKTD	WASdAXY2	
M81820/2-dKUD	WASdAXY4	
M81820/2-dKD	WASdAX	
M81820/2-dTD	WASdAY2	
M81820/2-dUD	WASdAY4	
M81820/2-dD	WASdA	
M81820/2-dPKTD	ZWASdAXY2	SZWASdAXY2
M81820/2-dPKUD	ZWASdAXY4	SZWASdAXY4
M81820/2-dPKD	ZWASdAX	SZWASdAX
M81820/2-dPTD	ZWASdAY2	SZWASdAY2
M81820/2-dPUD	ZWASdAY4	SZWASdAY4
M81820/2-dPD	ZWASdA	SZWASdA

Where

d = Nominal bore code, with $5 \leq d \leq 16$

Example

AS part number	SKF designation	
M81820/3- 5EKT	SZEWAS 5ARXY2	
M81820/3-10PKU	ZEWAS10ARXY4	SZEWAS10ARXY4
M81820/2- 6EUD	SZWAS 6AY4	
M81820/2-12PD	ZWAS12A	SZWAS12A

NSA part number	SKF designation
NSA8134-**d'**X	SN**d**ZX
NSA8134-**d'**	SN**d**Z
NSA8136-**d'**X	SN**d**GX
NSA8136-**d'**	SN**d**G

Where
d = Bore code
d' = 0d for d ≤ 8
d for 10 ≤ d ≤ 20
28 for d = 28PR

Example

NSA part number	SKF designation
NSA8134-**04**X	SN**04**ZX
NSA8136-**10**	SN**10**G

NSA part number	SKF designation
NSA8135-**d'**X	SW**d**ZX
NSA8135-**d'**	SW**d**Z
NSA8137-**d'**X	SW**d**GX
NSA8137-**d'**	SW**d**G

Where
d = Bore code
d' = 0d for d ≤ 8
d for d ≥ 10

Example

NSA part number	SKF designation
NSA8135-**04**X	SW**04**ZX
NSA8137-**10**	SW**10**G

3

Rod ends

3 Rod ends

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 274**.

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

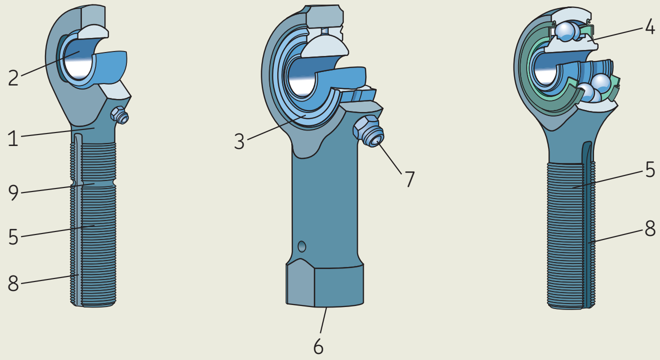
See **figure 1.**

For detailed information about which type of bearing is most suitable for a given application, refer to *Rod end bearing types selection criteria* **page 274**.

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



1 Rod end body
2 Integrated metal-to-metal spherical plain bearing
3 Inserted spherical plain bearing
4 Integrated rolling bearing
5 Rod end shank with external (male) thread
6 Rod end shank with internal (female) thread
7 Grease fitting
8 Keyway (vertical groove)
9 Locating groove (horizontal groove)

Table 1

SKF rod ends, metric dimensions

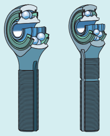
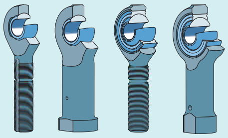
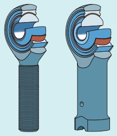
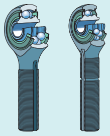
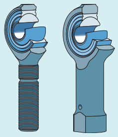
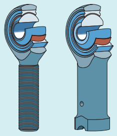
Type			Thread	Standard	SKF Rod end series	SKF bearing series	Table number	Page
Ball bearing rod ends		Integrated	External	EN 3541, EN 4036	C..MJ, CN..MJ	N/A	3.1	286
		Integrated	External	–	C..M, CN..M, CN..M..SP1	N/A	3.2	288
Metal-to-metal rod ends		Integrated	External	–	EM..	N/A	3.3	290
		Inserted	External	–	EMJ/ML..	ML..R metric	3.4	292
		Inserted	External	–	EMJ/MT..	MT..R metric	3.5	294
		Integrated	Internal	–	EF..	N/A	3.6	296
		Inserted	Internal	–	EFJ/ML..	ML..R metric	3.7	298
		Inserted	Internal	–	EFJ/MT..	MT..R metric	3.8	300
Self-lubricating rod ends		Inserted	External	EN 2498, EN 4198	EMA..	HMEN..R metric	3.9	302
		Inserted	External	–	EMJ/RL..	WEN..R metric	3.10	304
		Inserted	External	–	EMJ/RT..	XRT..R metric	3.11	306
		Inserted	Internal	–	EFJ/RL..	WEN..R metric	3.12	308
		Inserted	Internal	–	EFJ/RT..	XRT..R metric	3.13	310

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	312
		Integrated	External	EN 4156, EN 4157	CN..	N/A	3.15	316
		Integrated	External	AS 21151	REP..M, RA..M, RAP..M	N/A	3.16	322
		Integrated	Internal	AS 21153	REP..	N/A	3.17	324
Metal-to-metal rod ends		Inserted	External	–	EMJ/..ML..R	ML..R inch	3.18	326
		Inserted	External	–	EMJ/..MT..R	MT..R inch	3.19	328
		Inserted	Internal	–	EFJ/..ML..R	ML..R inch	3.20	330
		Inserted	Internal	–	EFJ/..MT..R	MT..R inch	3.21	332
Self-lubricating rod ends		Inserted	External	AS 81935/1	MJ/WAS..	WAS..R inch, EWAS..R inch	3.22	334
		Inserted	External	AS 81935/4	MJ/NAS..	NAS..R inch, ENAS..R inch	3.23	336
		Inserted	External	AS 81935/6	PHMJ/WAS..	WAS..R inch, EWAS..R inch	3.24	338
		Inserted	External	AS 81935/8	PHMJ/NAS..	NAS..R inch, ENAS..R inch	3.25	340
		Inserted	External	NSA 8143	R..M..	SW..G inch	3.26	342
		Inserted	External	–	F/RL..R	WAS..R inch	3.27	344
		Inserted	External	–	EMJ/RT..R	XRT..R inch	3.28	346
		Inserted	Internal	AS 81935/2	FJ/WAS..	WAS..R inch, EWAS..R inch	3.29	348
		Inserted	Internal	AS 81935/5	FJ/NAS..	NAS..R inch, ENAS..R inch	3.30	352
		Inserted	Internal	AS 81935/7	PHFJ/WAS..	WAS..R inch, EWAS..R inch	3.31	356
		Inserted	Internal	AS 81935/9	PHFJ/NAS..	NAS..R inch, ENAS..R inch	3.32	360
		Inserted	Internal	NSA 8149	R..F..	SW..G inch	3.33	364
		Inserted	Internal	–	EFJ/RL..R	WAS..R inch	3.34	368
		Inserted	Internal	–	EFJ/RT..R	XRT..R inch	3.35	370

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 283**
- External (male) or internal (female) thread types to adapt to the application interface, refer to **page 283**
- Lubrication features, refer to **page 278**, Sealing solutions, refer to **pages 276, 280** and **282**, corrosion-resistant materials, refer to **pages 276, 279** and **281** and surface treatments, refer to **pages 276, 280** and **282** 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 285**.

Contact your regional SKF partner via: 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 1** in Airframe introduction **page 19** 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 121** for selection guidelines between metal-to-metal or self-lubricating bearing types
- For rolling bearings, refer to *Rolling bearings chapter* **page 20** for more information

With the selected bearing type, refer to the relevant rod end section for detailed information:

- *Ball bearing rod end* **page 275**
- *Metal-to-metal spherical plain bearing rod end* **page 277**
- *Self-lubricating spherical plain bearing rod end* **page 281**

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 20**.

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 283**
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 282**.
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 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 275**, material **page 276** and surface treatment **page 276**.

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 285**.

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 31**, are listed in the relevant product tables.

Figure 2

Ball bearing rod ends

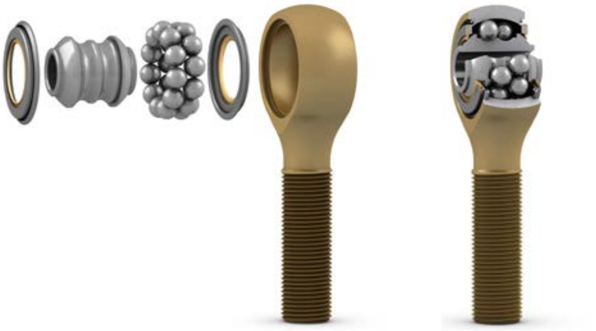


Table 3

Standard greases

NATO codes	Standard	Operating temperature
G354 type I	MIL PRF 23827 type I	–73 to +121 °C *–100 to +250 °F*
–	MIL PRF 23827 type II	–73 to +121 °C *–100 to +250 °F*
G395	MIL PRF 81322	–54 to +177 °C *–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 35**: Bearing steel 100C6 or corrosion-resistant steel 440C.

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.

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

Corrosion-resistant steel rod ends can be passivated, as required by the relevant standards. Passivation is applied in accordance with AMS 2700.

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 285** 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 37**.

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 For AS series = 59 to 63 For other series ≥ 60	For AS series = 15[1] to 45 for rod end shank and 32 to 48 for rod end head For other series = 20 to 40	For EN series > 830	Moderate	9315	EN 2099	AMS 6263	16NCD13
Case hardening corrosion-resistant steel	For EN series ≥ 58 For AS series = 59 to 63 For other series ≥ 60	For AS series = 15[1] to 45 for rod end shank and 32 to 48 for rod end head For other series = 20 to 40	For EN series > 830	Good	431	EN 3490	AMS 5628	Z15CN17.03

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[1] Equivalent to 92,5 HRB

Metal-to-metal spherical plain bearing rod ends

Design

Metal-to-metal rod ends consist of either:

- An inner ring integrated into the rod end head, which 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 282**.

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 283**
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 282**.
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 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 125**.
7 Choose all other options, including *Lubrication* **page 278** and *Sealing solutions* **page 280**.

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 278** or contact SKF for a customized design solution as described in *Customized product* **page 285**.

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 283**.
2. Use the metal-to-metal spherical plain bearing selection process **page 124** 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 282**.
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 278**, *Materials* **page 279** and *Surface treatments* **page 280**.

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 277** or contact SKF for a customized design solution as described in the *Customized products* **page 285**.

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 279**. 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

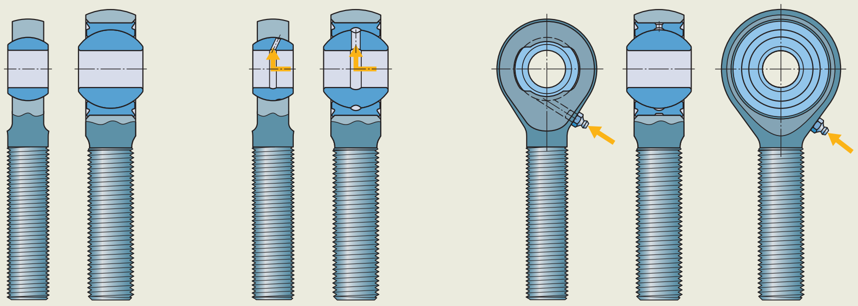
Table 5

Standard greases

NATO codes	Standard	Operating temperature
G354 type I	MIL PRF 23827 type I	–73 to +121 °C *–100 to +250 °F*
G395	MIL PRF 81322	–54 to +177 °C *–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 126**.

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 285**).

Rod end data

Material

As specified in *Metal-to metal spherical plain bearing – Material* **page 128**, 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 125**)

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 be reduced by typically 55%.

Other materials are available on request. Refer to *Customized products* **page 285**.

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	For EN series = 33 to 39 For AS series = 39 to 42	≥ 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 or zinc-nickel plated.

Corrosion-resistant steel rod ends can be passivated, as required by the relevant standards. Cadmium plating[1] or zinc-nickel plating can be performed upon request for enhanced corrosion resistance and/or fretting resistance

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 129**.

Passivation is applied in accordance with AMS 2700.
Cadmium plating[1] is applied in accordance with AMS-QQ-P-416 or AMS03-19[2].
Zinc-nickel plating is applied in accordance with AMS 2417.
Anodizing is applied in accordance with MIL-A-8625.

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 285** 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 130**.

SKF also supplies special sealing solutions for integrated rod ends operating under specific application conditions. Refer to *Customized products* **page 285**.

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[1] Treatment includes chromium 6 compounds and may be subject to environmental legislation.
[2] Formerly DEF STAN 03-19

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 273** 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 283**.
2. Use the self-lubricating spherical plain bearing selection process **page 132** 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 282**.
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 285**.

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 137.**

Rod end data

Material

Self-lubricating plain bearing materials are as specified in *Self-lubricating spherical plain bearing – Material* **page 138**:

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 be reduced by typically 55%.

Other materials are available on request. Refer to *Customized products* **page 285**.

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 For AS series = 39 to 42	≥ 1080	Moderate	30NCD16	EN 2137/ EN 2475	–	S97
	39 to 42	≥ 1080	Moderate	4340	–	AMS 6415, AMS-S-5000	40NCD7
Corrosion-resistant steel	35 to 42	≥ 1080	Good	17-4PH H1025	EN 2539/ EN 3161	AMS 5643	Z6CNU17.04 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 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. Cadmium plating1) or zinc-nickel plating can be applied upon request for enhanced corrosion resistance and/or fretting resistance

Passivation is applied in accordance with AMS 2700.
Cadmium plating1) is applied in accordance with AMS-QQ-P-416 or AMS03-192).
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 139**.

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 285** and contact SKF.

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**.

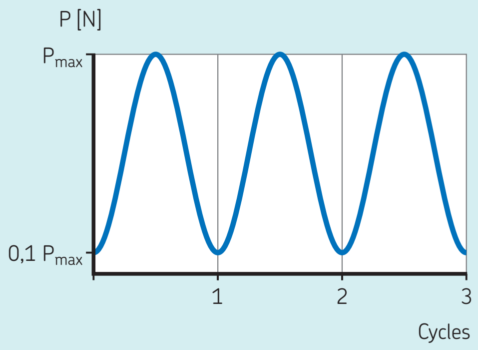
Lined bore

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 140**, are applicable.

Diagram 1

Fatigue load



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*]

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[1] Treatment includes chromium 6 compounds and may be subject to environmental legislation.
[2] Formerly DEF STAN 03-19

AS 81935[3] 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.

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 285** 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 with external 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**.

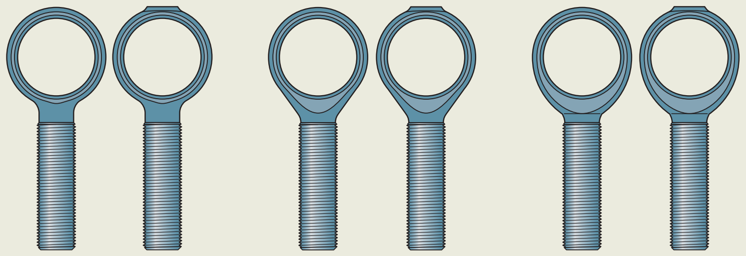
Locating locking hole

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**

Figure 7

Rod end head shapes



Round head *Angled head* *Tear drop*

Figure 8

Rod end thread types

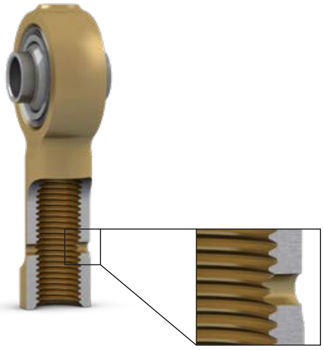
External *Internal*

Figure 9

Rod end grooves

Figure 10

Rod end locating hole



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[3] Bearings, plain, rod end, self-aligning, self-lubricating, general specification for –54 to 163 °C (*–65 to +325 °F*)

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 39** for rolling bearings and **page 143** for spherical plain bearings.

When attaching rod ends to threaded rods or extension tubes (**figure 11**), use a counter locking nut or a tab washer.

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 40** for rolling bearings and **page 145** 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

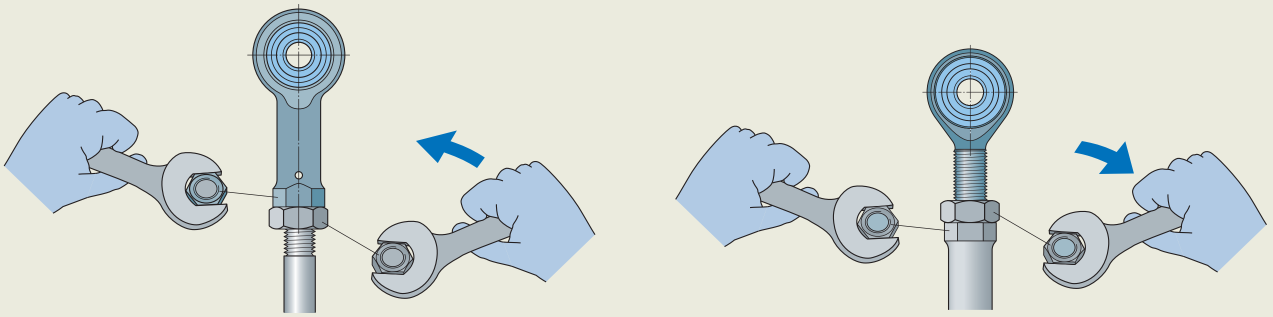
Storage life

	Ball bearing rod end	Metal-to-metal rod end	Self-lubricating rod end
Storage life	5 years	5 years	15 years[1]
Storage temperature	15 to 35 °C *(59 to 95 °F)*	15 to 35 °C *(59 to 95 °F)*	15 to 25 °C *(59 to 70 °F)*
Relative humidity	50 to70%	50 to70%	*50 to70%*

[1] 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

Figure 11

Securing a rod end with a right-hand thread



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**
- **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 :

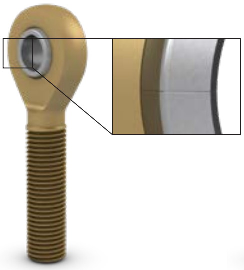
- EN 4351

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

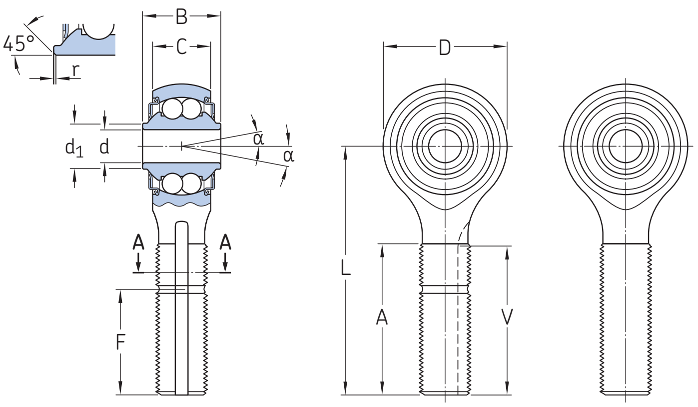
Cross-reference to legacy products

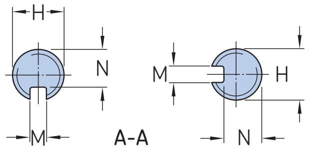
Variant	**Cross-reference designation system**	**SKF Aerospace France designation system** Lons-le-saunier (Formerly known as SARMA)	**SKF Aerospace U.K. Limited designation system** Clevedon (Formerly known as AMPEP)
Wide inch external thread	**MJ/WAS..**	UMJ/XRL..	12BM..
Narrow inch external thread	**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 (bearing in bearing steel) EN 4036 (bearing in corrosion-resistant steel)





Keyway type 1 Keyway type 2

Dimensions

Nominal bore code	Dimensions d 0/–0,008	D +0,2/0	B 0/–0,12	C +0,1/0	A Min	V +0,5/–1	d_1 ≈	H 4h 6h	L ±0,5	F Min	M +0,1/0	N 0/–0,1
–	mm							–	mm			
5	5	20,5	12	8,5	33	33	7,6	MJ8 × 1	48	18	1,6	6,6
N6	6	22,5	14	10	37	37	8,6	MJ10 × 1,25	54	23	2,4	8,0
N8	8	28,5	15	10	42	42	11,1	MJ12 × 1,25	62	27	2,4	10,2
N10	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 r +0,3/–0,2	α	Mass ≈	Limit static loads Radial C_s	Axial C_a	Max. rotational torque Shielded	Sealed	Max. swivelling torque	Max. axial clearance	Radial clearance EN 4036 (bearing in corrosion-resistant steel)	EN 3541 (bearing in bearing steel) Maximum
–	mm	°	g	kN		mNm			µm		
5	0,5	8	35	4,7	1,5	1	2	150	80	1/5	20
N6	0,5	8	60	6,8	2,11	2	4	150	80	1/5	20
N8	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: ZXCN6MJEGRKN811
WC5MJN741

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
S1)	Bearing steel	Zinc-nickel plated steel
W1)	Corrosion-resistant steel	Cadmium plated steel
SW1)	Corrosion-resistant steel	Zinc-nickel plated steel
X	Corrosion-resistant steel	Corrosion-resistant steel
ZX1)	Corrosion-resistant steel	Cadmium plated corrosion-resistant steel
SZX1)	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 groove1)
R	With locating groove

Keyway

No code	Without keyway
K	With keyway type 1
K2	With keyway type 2

Lubricant

N741	Grease G354
N811	Grease G395

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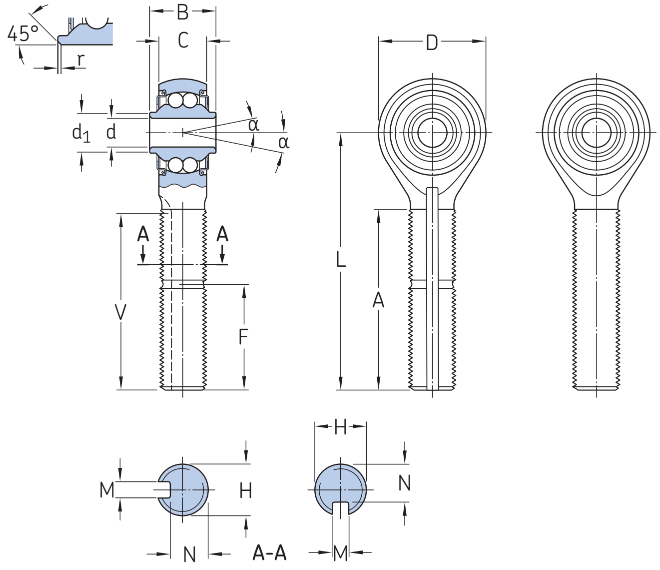
1) SKF option

3.2 External thread rod end with integrated rolling bearing (Metric dimensions)

C..M, CN..M, CN..M..SP1

Technical specification	EN 2067
Product standard	–



Dimensions

Nominal bore code	Dimensions											
	d 0/–0,008	D +0,2/0	B 0/–0,12	C +0,1/0	A Min	V +0,5/0	d_1 ≈	H 4h	L ±0,5	F Min	M +0,1/0	N 0/–0,1
–	mm							–	mm			
5	5	20,5	12	8,5	33	33	7,6	M8 × 1	48	18	1,6	6,6
N6	6	22,5	14	10	37	37	8,6	M10 × 1	54	22	2,4	8
N8	8	28,5	15	10	42	42	11,1	M12 × 1	62	25	2,4	10,2
N8..SP1	8	28,5	15	10	42	42	11,1	M12 × 1,5	62	25	2,4	10,2
N10	10	32	20	14	48	48	13,6	M14 × 1,5	73	31	3,2	12,2
N10..SP1	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		Mass	Static limit loads		Max. rotational torque		Max. swivelling torque	Max. axial clearance
	r +0,3/–0,2	α	≈	Radial C_s	Axial C_a	Shielded	Sealed		
–	mm	°	g	kN		mNm			µm
5	0,5	8	35	4,7	1,5	1	2	150	80
N6	0,5	8	50	6,8	2,1	2	4	150	80
N8	0,5	8	80	8,9	2,8	5	10	200	80
N8..SP1	0,5	8	80	8,9	2,8	5	10	200	80
N10	0,5	8	130	14	4,4	7	12	200	80
N10..SP1	0,5	8	130	14	4,4	7	12	200	80

Designation system

Example: ZXCN8MESP1GRKG81
C5M

ZX CN 8 M E SP1 G R K G81

Material and surface treatment

	Inner ring and balls	**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

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

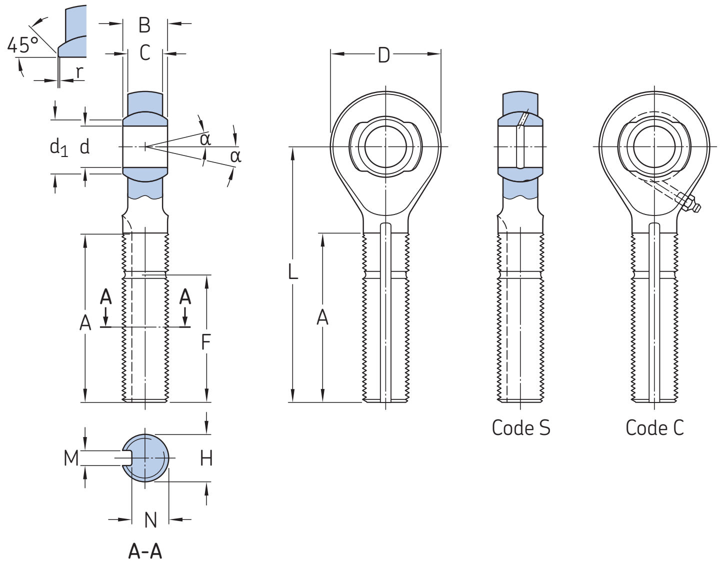
Lubricant

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 Δdmp	D +0,2/0	B 0/–0,06	C +0,1/0	A Min	V +0,5/0	H MJ 4h 6h	L ±0,5	d_1 ≈
–	mm	µm	mm					–	mm	
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	M +0,1/0	N 0/–0,1	r +0,3/0	α	Mass ≈	Ultimate radial load	Axial clearance EM	EFS/EFC
–	mm				°	g	kN	µm	
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

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

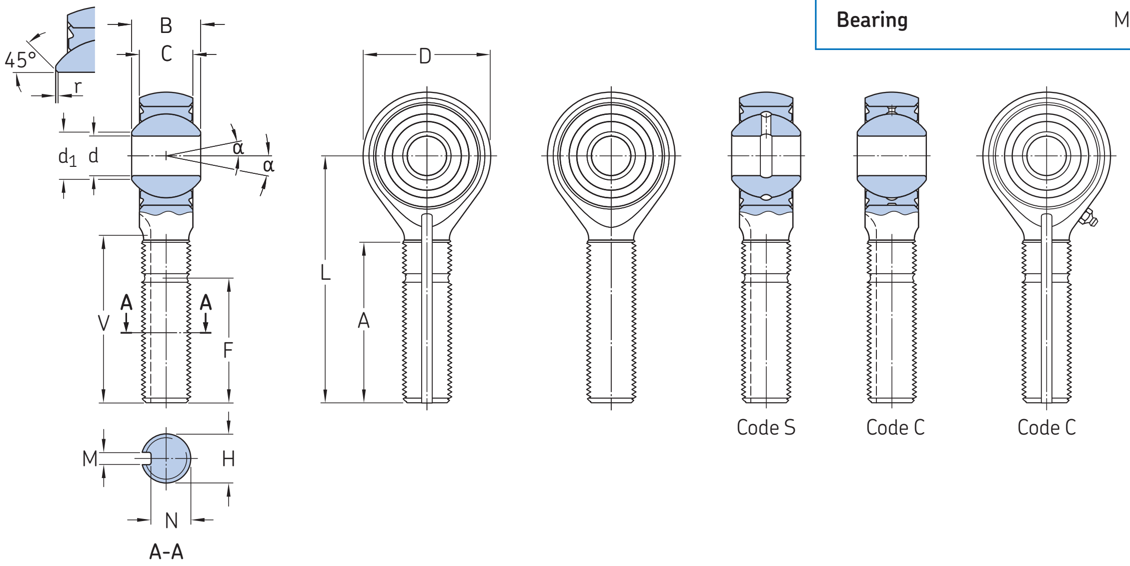
Lubricant

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 +0,2/0	B 0/–0,06	C +0,1/0	A Min	V +0,5/0	H MJ 4h 6h	L ±0,5	d_1 ≈	F
–	mm	µm	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 +0,1/0	N 0/-0.1	r +0,3/0	α	Mass ≈	Radial load Ultimate	Fatigue 10^6 cycles	Axial clearance Standard	Reduced
–	mm			°	g	kN		Nm	
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
17	4	17,4	0,1	9	285	130	22,3	17/75	35 max
20	4	19,4	0,1	9	340	150	24,8	20/80	40 max
22	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

Designation system

Examples:	XEMJ/WQMLS6GRKX-2 EMJ/WML20	X EMJ/ WQ ML S 6 G R K X -2

Rod end body material

No code	Cadmium plated steel
S	Zinc-nickel plated steel
X	Corrosion-resistant steel
T[1)]	Anodized titanium

Basic designation

Bearing material

	Inner ring	**Outer ring**
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

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

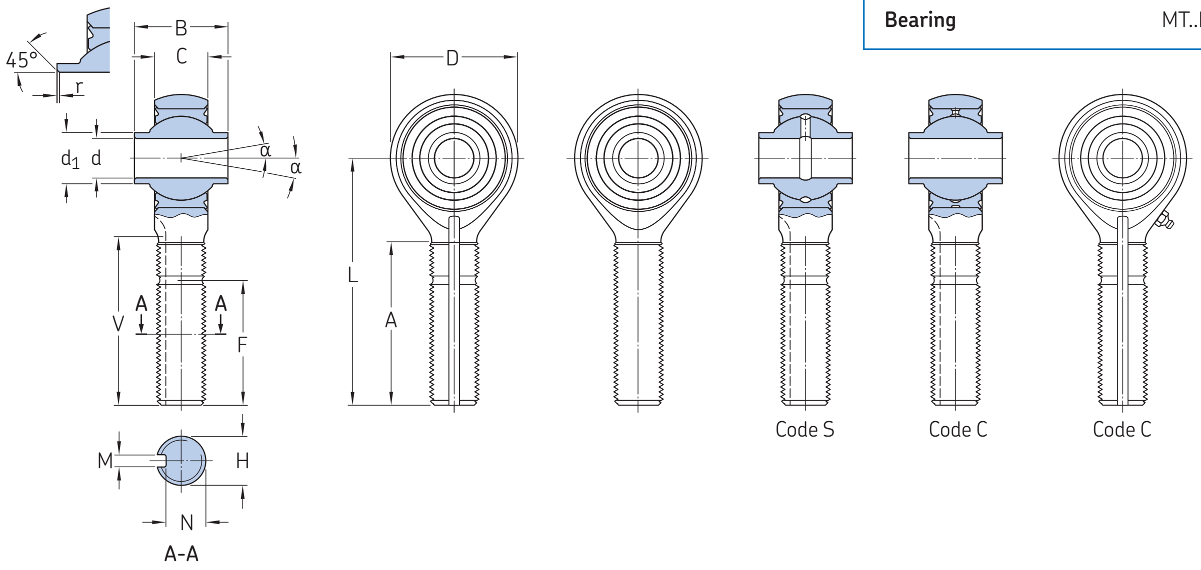
---

1) 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 +0,2/0	B 0/–0,06	C +0,1/0	A Min	V +0,5/0	H MJ 4h 6h	L ±0,5	d_1 ≈	F
–	mm	µm	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				Mass	Radial loads		Axial clearance	
	M +0,1/0	N 0/-0.1	r +0,3/0	α	≈	Ultimate	Fatigue 10^6 cycles	Standard	Reduced
–	mm			°	g	kN		Nm	
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	5	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

Designation system

Examples:	XEMJ/WQMTS6GRKX-2 EMJ/WMT20

X EMJ/ WQ MT S 6 G R K X -2

Rod end body material

No code	Cadmium plated steel
S	Zinc-nickel plated steel
X	Corrosion-resistant steel
T[1]	Anodized titanium

Basic designation

Bearing material

	Inner ring	**Outer ring**
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

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

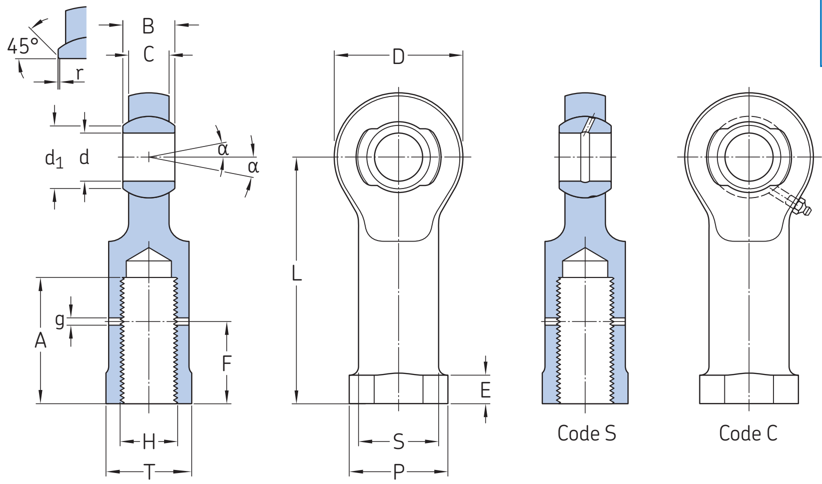
---

[1] 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 Δdmp	D +0,2/0	B 0/–0,06	C +0,1/0	A Min	H MJ 4H 5H	L ±0,5	P ±0,2	d_1 ≈	g ≈
–	mm	µm	mm				–	mm			
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	r +0,3/0	α	Mass ≈	Ultimate radial load	Axial clearance EF	EFS/EFC
–	mm					°	g	kN	µm	
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

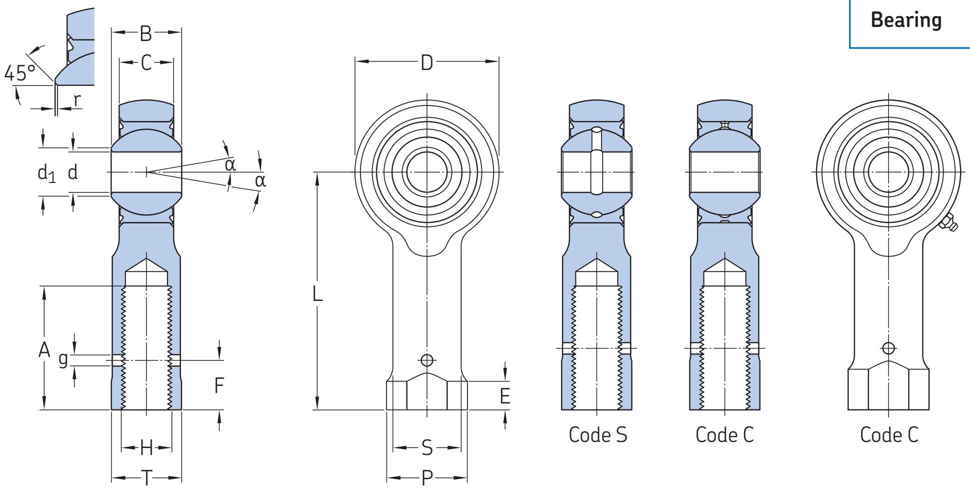
Lubricant

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 +0,2/0	B 0/–0,06	C +0,1/0	A Min	H MJ 4H 5H	L ±0,5	P ±0,2	d_1 ≈	g ≈
–	mm	µm	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 +0.5/0	S ±0.1	T 0/-0.25	E	r +0,3/0	α	Mass ≈	Radial loads Ultimate	Fatigue 10^6 cycles	Axial clearance Standard	Reduced
–	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

Designation system

Examples:	XEFJ/WQMLS6GX-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[1]	Anodized titanium

Basic designation

Bearing material

	Inner ring	**Outer ring**
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

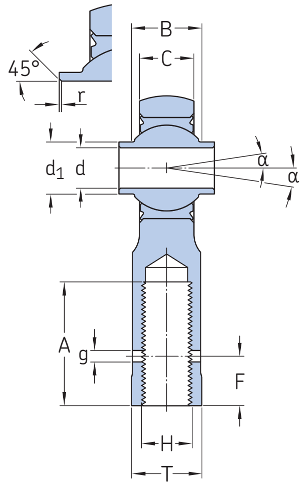
---

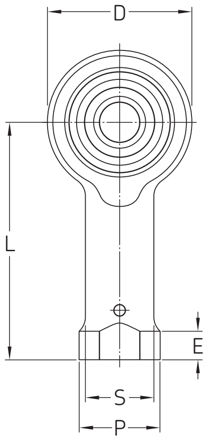
[1] SKF option, masses and load carrying capability reduced compared to steel rod end body.

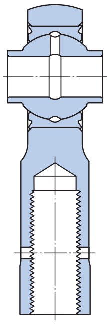
3.8 Internal thread inserted high misalignment metal-to-metal spherical plain bearing rod end (Metric dimensions)

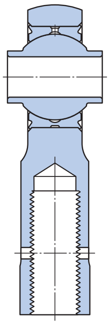
EFJ/..MT

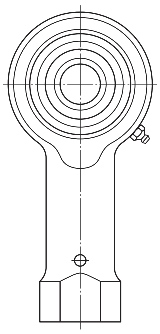
Technical specification	–
Product standard	–
Bearing	MT..R






Code S


Code C


Code C

Dimensions

Nominal bore code	Dimensions d	Tolerances Δdmp	D +0,2/0	B 0/–0,06	C +0,1/0	A Min	H MJ 4H 5H	L ±0,5	P ±0,2	d_1 ≈	F +0.5/0 ≈
–	mm	µm	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	T 0/-0.25	E	r +0,3/0	g ≈	α	Mass ≈	Radial loads Ultimate	Fatigue 10^6 cycles	Axial clearance Standard	Reduced
–	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

Designation system

Examples: XEFJ/WQMTS6GX-2
EFJ/WMT20

X EFJ/ WQ MT S 6 G X -2

Rod end body material

No code	Cadmium plated steel
S	Zinc-nickel plated steel
X	Corrosion-resistant steel
T[1]	Anodized titanium

Basic designation

Bearing material

	Inner ring	**Outer ring**
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

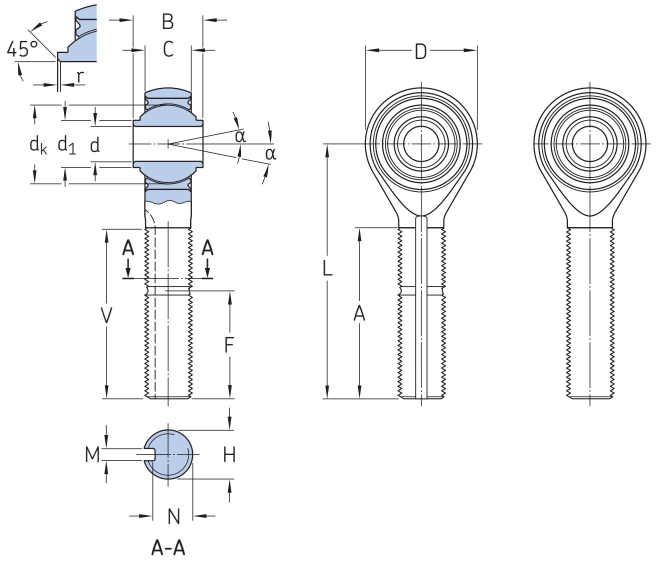
---

[1] 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 (Cadmium plated steel 30NCD16 rod end) EN 4198 (Corrosion-resistant steel 17-4PH H1025 rod end)
Bearing	HMEN..R metric



Dimensions

Nominal bore code	Dimensions d Δdmp 0/–0,008	D +0,2/0	B 0/–0,06	C +0,1/0	A Min	V +0,5/–1	H ISO M thread[1] 4h 6h	ISO MJ thread (code J) 4h 6h	L ±0,5	d_k ≈	d_1 ≈
–	mm						–		mm		
6	6	22,5	14	8,2	37	37	M10 × 1	MJ10 × 1,25	54	15,0	9
8	8	26	15	10,2	42	42	–	MJ12 × 1,25	62	17,5	11
8SP1A[1]	8	26	15	10,2	42	42	M12 × 1,5	–	62	17,5	11
10[2]	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 F Min	M +0,1/0	N 0/–0,1	r +0,3/–0,2	α	Mass ≈	Radial loads Ultimate	Fatigue 10^6 cycles	Rotational torque
–	mm				°	g	kN		Nm
6	23	2,4	8	0,5	9	46	27,0	4,5	0,45/1,3
8	27	2,4	10,2	0,5	8	76	39,0	6,0	0,7/2
8SP1A[1]	27	2,4	10,2	0,5	8	76	39,0	6,0	0,7/2
10[2]	31	3,2	12,2	0,5	10	135	58,0	9,2	0,7/2

[1] SKF option

[2] 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.

Designation system

Example: XEMAJ6GRK
TEMA8SP1A

X EMA J 6 G R K

Rod end body material and surface treatment

No code	Cadmium plated steel
S[1]	Zinc-nickel plated steel
X	Corrosion resistant steel
T[2]	Anodized titanium

Basic designation

Thread profile

No code[1]	ISO M Profile thread
J	ISO MJ Profile thread

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

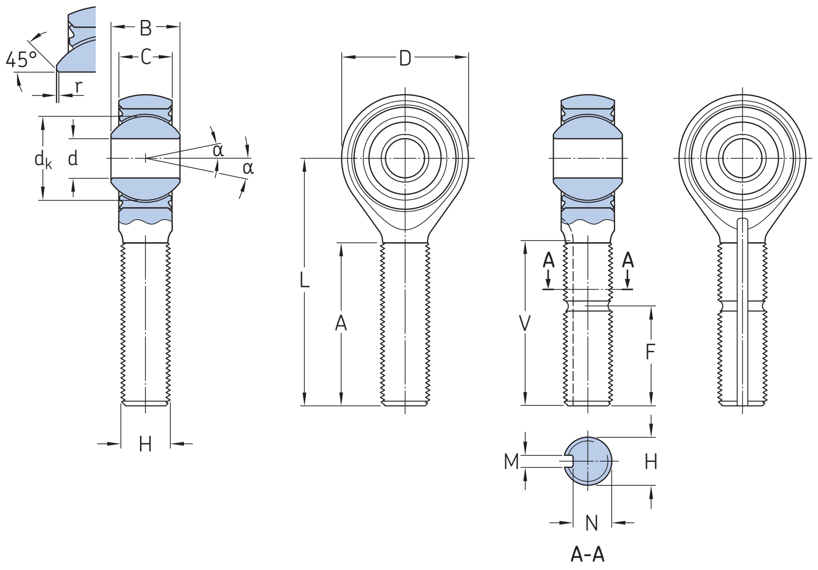
---

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	AS 81820 for the bearing
Product standard	–
Bearing	WEN ..R metric



Dimensions

Nominal bore code	Dimensions d	Tolerances Δdmp	D +0,2/0	B 0/–0,06	C +0,1/0	A Min	V +0,5/0	H MJ 4h 6h	L ±0,5	d_k ≈
–	mm	µm	mm					–	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	Fatigue 10^6 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

Designation system

Example: XEMJ/RL6GRKX
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[1]	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

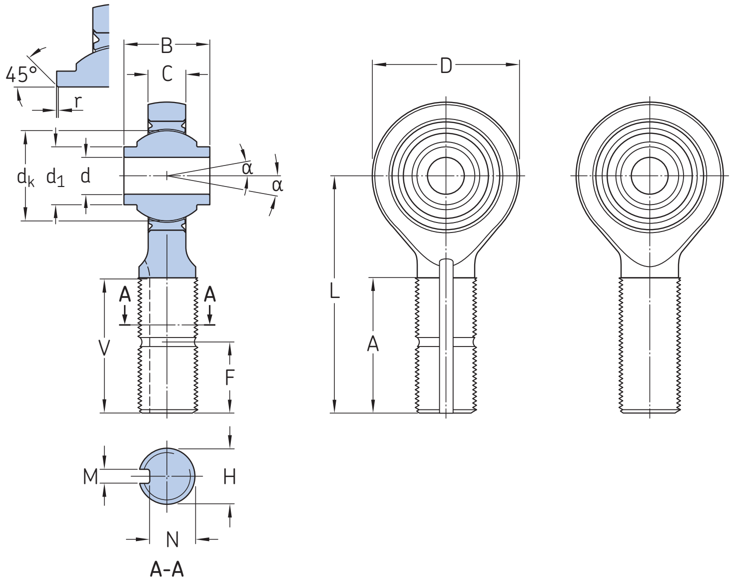
---

[1] 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	AS 81820 for the bearing
Product standard	–
Bearing	XRT..R metric



Dimensions

Nominal bore code	Dimensions d	Tolerances Δdmp	D	B	C	A	V	H MJ	L	d_k	d_1
			+0,2/0	0/–0,06	+0,1/0	Min	+0,5/0	4h 6h	±0,5	≈	≈
–	mm	µm	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	M	N	r	α	Mass	Radial loads Ultimate	Fatigue	Starting torque Standard	Reduced
	Min	+0,1/0	0/–0,1	+0,3/0		≈		10^6 cycles		
–	mm				°	g	kN		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	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

Designation system

Example:	XEMJ/RT6GRKX EMJ/RT22

X EMJ/RT 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(1)	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

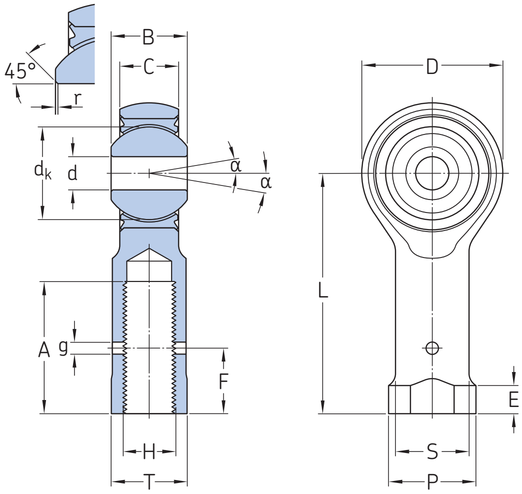
No code	Standard
X	Reduced

---

(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	AS 81820 for the bearing
Product standard	–
Bearing	WEN..R metric

Dimensions

Nominal bore code	Dimensions d	Tolerances Δdmp	D +0,2/0	B 0/–0,06	C +0,1/0	A Min	H MJ 4h 6h	L ±0,5	P ±0,2	d_k ≈
–	mm	µm	mm				–	mm		
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 +0,5/0	S ±0,1	T 0/–0,25	E ≈	r +0,3/0	g ≈	α	Mass ≈	Radial loads Ultimate	Fatigue 10^6 cycles	Starting torque Standard	Reduced
–	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

Designation system

Example: XEFJ/RL6GX
EFJ/RL25

X EFJ/RL 6 G X

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[1]	Anodized titanium

Basic designation

Bore code

Thread direction

No code	Right-hand thread
G	Left-hand thread

Starting torque

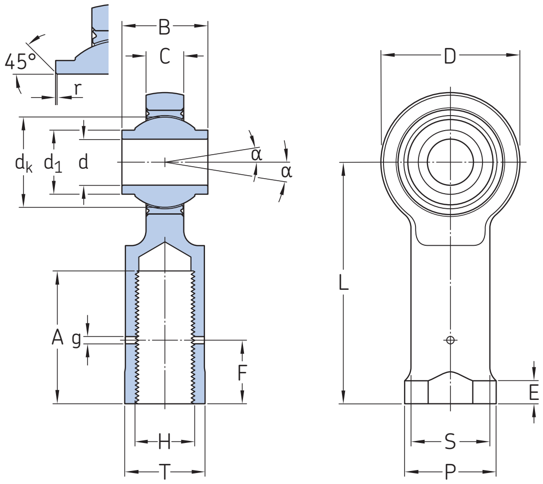
No code	Standard
X	Reduced

---

[1] SKF option, masses and load carrying capability reduced compared to steel rod end body.

3.13 Internal thread inserted high misalignment self-lubricating spherical plain bearing rod end (Metric dimensions)

EFJ/RT..



Technical specification	AS 81820 for the bearing
Product standard	–
Bearing	XRT..R

Dimensions

Nominal bore code	Dimensions d	Tolerances Δdmp	D +0,2/0	B 0/–0,06	C +0,1/0	A Min	H MJ 4H 5H	L ±0,5	P ±0,2	d_k ≈	d_1 ≈	g ≈	F +0.5/0
–	mm	µm	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	T 0/-0.25	E ≈	r +0,3/0	α	Mass ≈	Radial loads Ultimate	Fatigue 10^6 cycles	Starting torque Standard	Reduced
–	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	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

Designation system

Examples:	XEFJ/RT6GX EFJ/RT22

X EFJ/RT 6 G 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[1]	Anodized titanium

Basic designation

Bore code

Thread direction

No code	Right-hand thread
G	Left-hand thread

Starting torque

No code	Standard
X	Reduced

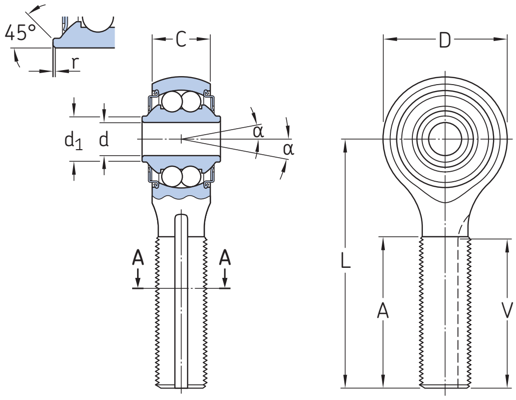
---

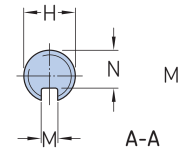
[1] SKF option, masses and load carrying capability reduced compared to steel rod end body.

3.14 External thread rod end with integrated rolling bearing (inch dimensions)

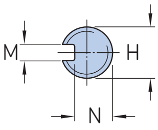
CN..SP bore code **6,35..SP24** to **7,94..SP4** and **6,35..SP18** to **7,94..SP11**

Technical specification	–
Product standard	–
Grease	G354





Keyway type 1



Keyway type 2

Dimensions

Nominal bore code		Keyway type	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A ≈	V +0.02/0 *+0,5/0*	d1 ≈	H 3A	L ≈	M +0.005/0 *+0,127/0*
–			in/*mm*							–	mm	
6,35..SP24[1]	**6,35..SP18**[2]	**1**	0.2500 *6,350*	0.886 *22,5*	0.551 *14*	0.394 *10*	1.063 *27*	1.063 *27*	0.323 *8,204*	1/4-28 *6,35-28*	2.126 *54*	0.063 *1,6*
6,35..SP6[1]	**6,35..SP23**[2]	**1**	0.2500 *6,350*	0.886 *22,5*	0.551 *14*	0.394 *10*	1.457 *37*	1.457 *37*	0.323 *8,204*	5/16-24 *7,94-24*	2.126 *54*	0.063 *1,6*
6,35..SP2[1]	**6,35..SP8**[2]	**2**	0.2500 *6,350*	0.886 *22,5*	0.551 *14*	0.394 *10*	1.457 *37*	1.457 *37*	0.323 *8,204*	3/8-24 *9,52-24*	2.126 *54*	0.095 *2,4*
6,35..SP19[1]	**6,35..SP19**[2]	**1**	0.2500 *6,350*	0.886 *22,5*	0.551 *14*	0.394 *10*	1.654 *42*	1.654 *42*	0.323 *8,204*	7/16-20 *11,11-20*	2.362 *60*	0.095 *2,4*
6,35..SP20[1]	**6,35..SP20**[2]	**1**	0.2500 *6,350*	0.886 *22,5*	0.551 *14*	0.394 *10*	2.047 *52*	2.047 *52*	0.323 *8,204*	1/2-20 *12,7-20*	3.051 *77,5*	0.095 *2,4*
6,35..SP21[1]	**6,35..SP21**[2]	**1**	0.2500 *6,350*	0.886 *22,5*	0.551 *14*	0.394 *10*	2.323 *59*	2.323 *59*	0.323 *8,204*	9/16-18 *14,29-18*	3.346 *85*	0.126 *3,2*
6,35..SP22[1]	**6,35..SP22**[2]	**1**	0.2500 *6,350*	0.886 *22,5*	0.551 *14*	0.394 *10*	2.480 *63*	2.480 *63*	0.323 *8,204*	5/8-18 *15,87-18*	3.150 *80*	0.126 *3*
7,94..SP7[1]	**7,94..SP7**[2]	**1**	0.3125 *7,938*	1.122 *28,5*	0.591 *15*	0.394 *10*	1.457 *37*	1.457 *37*	0.437 *11,100*	5/16-24 *7,94-24*	2.362 *60*	0.063 *1,6*
7,94..SP4[1]	**7,94..SP11**[2]	**1**	0.3125 *7,938*	1.122 *28,5*	0.591 *15*	0.394 *10*	1.457 *37*	1.457 *37*	0.437 *11,100*	3/8-24 *9,52-24*	2.362 *60*	0.095 *2,4*

---

[1] 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)

[2] For other materials/surface treatments (codes W, SW, X, ZX and SZX)

Designation system

Examples: ZXCN6,35MESP24GF
WCN6,35SP23

ZX CN 6,35 M E SP24 G F

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

Keyway

No code	Without keyway
F	With keyway

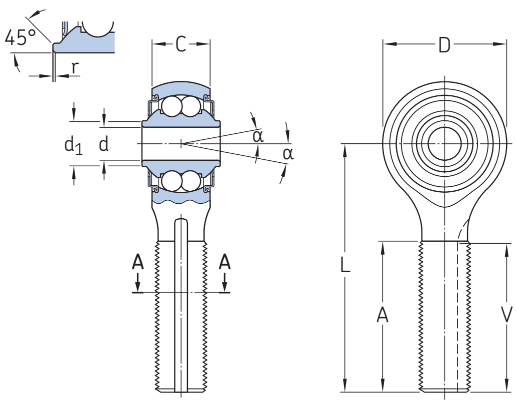
Dimensions cont. loads, torque and clearance

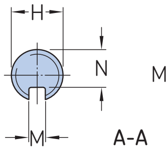
Nominal bore code		Keyway type	Dimensions N +0.005/0 *+0.127/0*	r +0.012/–0.003 *+0.305/–0,076*	α	Mass ≈	Limit static loads Radial C_s	Axial C_a	Axial clearance Max	Swivelling torque Max
–			in/*mm*		°	lb/*g*	lbf/*kN*		in/*mm*	oz.in/*mN.*
6,35..SP24[1]	6,35..SP18[2]	1	0.202 *5,11*	0.02 *0,5*	8	0.08 *37*	1 529 *6,8*	472 *2,1*	0.003 *0,080*	21.242 *150*
6,35..SP6[1]	6,35..SP23[2]	1	0.260 *6,6*	0.02 *0,5*	8	0.09 *41*	1 529 *6,8*	472 *2,1*	0.003 *0,080*	21.242 *150*
6,35..SP2[1]	6,35..SP8[2]	2	0.311 *7,9*	0.02 *0,5*	8	0.10 *46*	1 529 *6,8*	472 *2,1*	0.003 *0,080*	21.242 *150*
6,35..SP19[1]	6,35..SP19[2]	1	0.370 *9,4*	0.02 *0,5*	8	0.12 *56*	1 529 *6,8*	472 *2,1*	0.003 *0,080*	21.242 *150*
6,35..SP20[1]	6,35..SP20[2]	1	0.436 *11,07*	0.02 *0,5*	8	0.16 *73*	1 529 *6,8*	472 *2,1*	0.003 *0,080*	21.242 *150*
6,35..SP21[1]	6,35..SP21[2]	1	0.478 *12,14*	0.02 *0,5*	8	0.17 *77*	1 529 *6,8*	472 *2,1*	0.003 *0,080*	21.242 *150*
6,35..SP22[1]	6,35..SP22[2]	1	0.539 *13,7*	0.02 *0,5*	8	0.22 *98*	1 529 *6,8*	472 *2,1*	0.003 *0,080*	21.242 *150*
7,94..SP7[1]	7,94..SP7[2]	1	0.260 *6,6*	0.02 *0,5*	8	0.13 *60*	2 424 *10,8*	764 *3,4*	0.003 *0,080*	28.322 *200*
7,94..SP4[1]	7,94..SP11[2]	1	0.311 *7,9*	0.02 *0,5*	8	0.14 *64*	2 424 *10,8*	764 *3,4*	0.003 *0,080*	28.322 *200*

3.14 External thread rod end with integrated rolling bearing (inch dimensions)

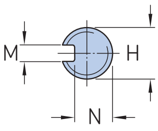
CN..SP bore code **7,94..SP5** to **9,52..SP7** and **7,94..SP2** to **9,52..SP7**

Technical specification	–
Product standard	–
Grease	G354





Keyway type 1



Keyway type 2

Dimensions

Nominal bore code		Keyway type	Dimensions d 0/–0.0005 *0/–0,0127*	 D ±0.010 *±0,254*	 B 0/–0.005 *0/–0,127*	 C ±0.005 *±0,127*	 A ≈	 V +0.02/0 *+0,5/0*	 d_1 ≈	 H 3A	 L ≈	 M +0.005/0 *+0,127/0*
–			in/*mm*							–	in/*mm*	
7,94..SP5[1]	**7,94..SP2**[2]	2	0.3125 *7,938*	1.122 *28,5*	0.591 *15*	0.394 *10*	1.654 *42*	1.654 *42*	0.437 *11,100*	7/16-20 *11,11-20*	2.441 *62*	0.095 *2,4*
7,94..SP8[1]	**7,94..SP8**[2]	1	0.3125 *7,938*	1.122 *28,5*	0.591 *15*	0.394 *10*	2.047 *52*	2.047 *52*	0.437 *11,100*	1/2-20 *12,7-20*	2.913 *74*	0.095 *2,4*
7,94..SP12[1]	**7,94..SP9**[2]	1	0.3125 *7,938*	1.122 *28,5*	0.591 *15*	0.394 *10*	2.323 *59*	2.323 *59*	0.437 *11,100*	9/16-18 *14,29-18*	3.150 *80*	0.126 *3,2*
7,94..SP10[1]	**7,94..SP10**[2]	1	0.3125 *7,938*	1.122 *28,5*	0.591 *15*	0.394 *10*	2.480 *63*	2.480 *63*	0.437 *11,100*	5/8-18 *15,87-18*	3.268 *83*	0.126 *3,2*
9,52..SP4[1]	**9,52..SP4**[2]	1	0.3750 *9,525*	1.260 *32*	0.787 *20*	0.551 *14*	1.457 *37*	1.457 *37*	0.535 *13,589*	3/8-24 *9,52-24*	2.441 *62*	0.095 *2,4*
9,52..SP5[1]	**9,52..SP5**[2]	1	0.3750 *9,525*	1.260 *32*	0.787 *20*	0.551 *14*	1.654 *42*	1.654 *42*	0.535 *13,589*	7/16-20 *11,11-20*	2.638 *67*	0.095 *2,4*
9,52..SP6[1]	**9,52..SP6**[2]	1	0.3750 *9,525*	1.260 *32*	0.787 *20*	0.551 *14*	2.047 *52*	2.047 *52*	0.535 *13,589*	1/2-20 *12,7-20*	2.953 *75*	0.095 *2,4*
9,52..SP2[1]	**9,52..SP3**[2]	2	0.3750 *9,525*	1.260 *32*	0.787 *20*	0.551 *14*	1.890 *48*	1.890 *48*	0.535 *13,589*	9/16-18 *14,29-18*	2.874 *73*	0.126 *3,2*
9,52..SP7[1]	**9,52..SP7**[2]	1	0.3750 *9,525*	1.260 *32*	0.787 *20*	0.551 *14*	2.480 *63*	2.480 *63*	0.535 *13,589*	5/8-18 *15,87-18*	3.346 *85*	0.126 *3,2*

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[1] 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)
[2] For other materials/surface treatments (codes W, SW, X, ZX and SZX)

Designation system

Examples: ZXCN6,35MESP24GF
WCN6,35SP23

ZX CN 6,35 M E SP24 G F

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

Keyway

No code	Without keyway
F	With keyway

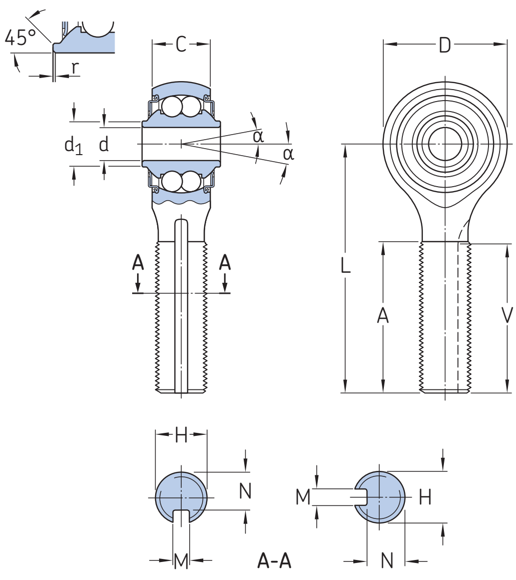
Dimensions cont. loads, torque and clearance

Nominal bore code		Keyway type	Dimensions N +0.005/0 *+0.127/0*	r +0.012/–0.003 *+0.305/–0,076*	α	Mass ≈	Limit static loads Radial C_s	Axial C_a	Axial clearance Max	Swivelling torque Max
–			in/*mm*		°	lb/*g*	lbf/*kN*		in/*mm*	oz.in/*mN.*
7,94..SP5 1)	7,94..SP2 2)	2	0.370 *9,4*	0.02 *0,5*	8	0.08 *37*	2 424 *10,8*	764 *3,4*	0.003 *0,080*	28.322 *200*
7,94..SP8 1)	7,94..SP8 2)	1	0.436 *11,07*	0.02 *0,5*	8	0.09 *41*	2 424 *10,8*	764 *3,4*	0.003 *0,080*	28.322 *200*
7,94..SP12 1)	7,94..SP9 2)	1	0.478 *12,14*	0.02 *0,5*	8	0.10 *46*	2 424 *10,8*	764 *3,4*	0.003 *0,080*	28.322 *200*
7,94..SP10 1)	7,94..SP10 2)	1	0.539 *13,7*	0.02 *0,5*	8	0.12 *56*	2 424 *10,8*	764 *3,4*	0.003 *0,080*	28.322 *200*
9,52..SP4 1)	9,52..SP4 2)	1	0.311 *7,9*	0.02 *0,5*	8	0.16 *73*	3 147 *14*	989 *4,4*	0.003 *0,080*	28.322 *200*
9,52..SP5 1)	9,52..SP5 2)	1	0.370 *9,4*	0.02 *0,5*	8	0.17 *77*	3 147 *14*	989 *4,4*	0.003 *0,080*	28.322 *200*
9,52..SP6 1)	9,52..SP6 2)	1	0.436 *11,07*	0.02 *0,5*	8	0.22 *98*	3 147 *14*	989 *4,4*	0.003 *0,080*	28.322 *200*
9,52..SP2 1)	9,52..SP3 2)	2	0.478 *12,14*	0.02 *0,5*	8	0.13 *60*	3 147 *14*	989 *4,4*	0.003 *0,080*	28.322 *200*
9,52..SP7 1)	9,52..SP7 2)	1	0.539 *13,7*	0.02 *0,5*	8	0.14 *64*	3 147 *14*	989 *4,4*	0.003 *0,080*	28.322 *200*

3.15 External thread rod end with integrated rolling bearing (inch dimensions)

CN.. bore code **6,35..4** to **6,35..10**

Technical specification	EN 2067
Product standard	EN 4156 (bearing in corrosion-resistant steel) EN 4157 (bearing in bearing steel)



Keyway type 1 Keyway type 2

Dimensions

Nominal bore code	Dimensions d	Δdmp	Δds	D ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A Min	d_1 ≈
–	in/*mm*							
6,35..4	0.2500 *6,350*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	0.886 *22,5*	0.551 *14*	0.394 *10*	1.063 *27*	0.33 *8,4*
6,35..5	0.2500 *6,350*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	0.886 *22,5*	0.551 *14*	0.394 *10*	1.457 *37*	0.33 *8,4*
6,35..6	0.2500 *6,350*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	0.886 *22,5*	0.551 *14*	0.394 *10*	1.457 *37*	0.33 *8,4*
6,35..7	0.2500 *6,350*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	0.886 *22,5*	0.551 *14*	0.394 *10*	1.654 *42*	0.33 *8,4*
6,35..8	0.2500 *6,350*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	0.886 *22,5*	0.551 *14*	0.394 *10*	2.047 *52*	0.33 *8,4*
6,35..9	0.2500 *6,350*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	0.886 *22,5*	0.551 *14*	0.394 *10*	2.323 *59*	0.33 *8,4*
6,35..10	0.2500 *6,350*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	0.886 *22,5*	0.551 *14*	0.394 *10*	2.480 *63*	0.33 *8,4*

Dimensions cont.

Nominal bore code	Dimensions H UNJF-3A	V ±0.02 *±0,5*	L ±0.010 *±0,25*	M +0.005/0 *+0,127/0*	N +0.005/0 *+0,127/0*	r	α	Mass ≈
–	–	in/*mm*					°	lb/*g*
6,35..4	1/4-28 *6,35-28*	1.15 *29,3*	2.126 *54*	0.063 *1,6*	0.202 *5,11*	0.01/0.02 *0,3/0,5*	8	0.08 *37*
6,35..5	5/16-24 *7,94-24*	1.55 *39,3*	2.126 *54*	0.063 *1,6*	0.260 *6,6*	0.01/0.02 *0,3/0,5*	8	0.09 *41*
6,35..6	3/8-24 *9,52-24*	1.55 *39,3*	2.126 *54*	0.095 *2,4*	0.311 *7,9*	0.01/0.02 *0,3/0,5*	8	0.10 *46*
6,35..7	7/16-20 *11,11-20*	1.74 *44,3*	2.362 *60*	0.095 *2,4*	0.370 *9,4*	0.01/0.02 *0,3/0,5*	8	0.12 *56*
6,35..8	1/2-20 *12,7-20*	2.14 *54,3*	3.051 *77,5*	0.095 *2,4*	0.436 *11,07*	0.01/0.02 *0,3/0,5*	8	0.16 *73*
6,35..9	9/16-18 *14,29-18*	2.41 *61,3*	3.346 *85*	0.126 *3,2*	0.478 *12,14*	0.01/0.02 *0,3/0,5*	8	0.17 *77*
6,35..10	5/8-18 *15,87-18*	2.57 *65,3*	3.150 *80*	0.126 *3,2*	0.539 *13,7*	0.01/0.02 *0,3/0,5*	8	0.22 *98*

Designation system

Examples:	ZXCN6,35-6GKG81 CN6,35E10

ZX	CN	6,35	-	6	G	K	G81

Material and surface treatment

	Inner ring and ball	**Rod end body**
No code	Bearing steel	Cadmium plated steel
S1)	Bearing steel	Zinc-nickel plated steel
W	Corrosion-resistant steel	Cadmium plated steel
SW1)	Corrosion-resistant steel	Zinc-nickel plated steel
X1)	Corrosion-resistant steel	Corrosion-resistant steel
ZX1)	Corrosion-resistant steel	Cadmium plated corrosion-resistant steel
SZX1)	Corrosion-resistant steel	Zinc-nickel plated corrosion-resistant steel

Basic designation

Bore code

Shield and seal

-	Shielded
E	Sealed

Thread direction

No code	Right-hand thread
G	Left-hand thread

Keyway

No code1)	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

Lubricant

No code	Grease G354 Type 1
G74	Grease MIL PRF 23827 type II
G81	Grease G395

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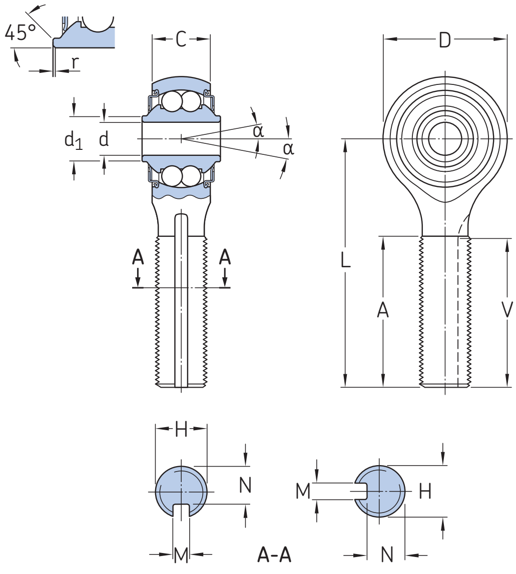
1) SKF option

Loads, torque and clearance

Nominal bore code	**Limit static loads** Radial C_s	 Axial C_a	**Rotational torque max** Shielded	 Sealed	**Swivelling torque** max	**Internal Clearances** Radial	 Axial max
–	lbf/*kN*		oz.in/*mN.m*			in/*mm*	
6,35..4	1 531	478	0.283	0.566	21.242	0.00004/0.0002	0.003
	6,810	*2,128*	*2,0*	*4,0*	*150*	*0,001/0,005*	*0,080*
6,35..5	1 531	478	0.283	0.566	21.242	0.00004/0.0002	0.003
	6,810	*2,128*	*2,0*	*4,0*	*150*	*0,001/0,005*	*0,080*
6,35..6	1 531	478	0.283	0.566	21.242	0.00004/0.0002	0.003
	6,810	*2,128*	*2,0*	*4,0*	*150*	*0,001/0,005*	*0,080*
6,35..7	1 531	478	0.283	0.566	21.242	0.00004/0.0002	0.003
	6,810	*2,128*	*2,0*	*4,0*	*150*	*0,001/0,005*	*0,080*
6,35..8	1 531	478	0.283	0.566	21.242	0.00004/0.0002	0.003
	6,810	*2,128*	*2,0*	*4,0*	*150*	*0,001/0,005*	*0,080*
6,35..9	1 531	478	0.283	0.566	21.242	0.00004/0.0002	0.003
	6,810	*2,128*	*2,0*	*4,0*	*150*	*0,001/0,005*	*0,080*
6,35..10	1 531	478	0.283	0.566	21.242	0.00004/0.0002	0.003
	6,810	*2,128*	*2,0*	*4,0*	*150*	*0,001/0,005*	*0,080*

3.15 External thread rod end with integrated rolling bearing (inch dimensions)

CN.. bore code **7,94..5** to **7,94..10**



Keyway type 1 Keyway type 2

Technical specification	EN 2067
Product standard	EN 4156 (bearing in corrosion-resistant steel) EN 4157 (bearing in bearing steel)

Dimensions

Nominal bore code	Dimensions d	Δdmp	Δds	D ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A Min	d_1 ≈
–	in/*mm*							
7,94..5	0.3125 *7,938*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.122 *28,5*	0.591 *15*	0.394 *10*	1.457 *37*	0.43 *10,8*
7,94..6	0.3125 *7,938*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.122 *28,5*	0.591 *15*	0.394 *10*	1.457 *37*	0.43 *10,8*
7,94..7	0.3125 *7,938*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.122 *28,5*	0.591 *15*	0.394 *10*	1.654 *42*	0.43 *10,8*
7,94..8	0.3125 *7,938*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.122 *28,5*	0.591 *15*	0.394 *10*	2.047 *52*	0.43 *10,8*
7,94..9	0.3125 *7,938*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.122 *28,5*	0.591 *15*	0.394 *10*	2.323 *59*	0.43 *10,8*
7,94..10	0.3125 *7,938*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.122 *28,5*	0.591 *15*	0.394 *10*	2.480 *63*	0.54 *13,8*

Dimensions cont.

Nominal bore code	Dimensions H UNJF-3A	V ±0.02 *±0,5*	L ±0.010 *±0,25*	M +0.005/0 *+0,127/0*	N +0.005/0 *+0,127/0*	r	α	Mass ≈
–	–	in/*mm*					°	lb/*g*
7,94..5	5/16-24 *7,94-24*	1.55 *39,3*	2.362 *60*	0.063 *1,6*	0.260 *6,6*	0.01/0.03 *0,3/0,8*	8	0.13 *60*
7,94..6	3/8-24 *9,52-24*	1.55 *39,3*	2.362 *60*	0.095 *2,4*	0.311 *7,9*	0.01/0.03 *0,3/0,8*	8	0.14 *64*
7,94..7	7/16-20 *11,11-20*	1.74 *44,3*	2.441 *62*	0.095 *2,4*	0.370 *9,4*	0.01/0.03 *0,3/0,8*	8	0.16 *71*
7,94..8	1/2-20 *12,7-20*	2.14 *54,3*	2.913 *74*	0.095 *2,4*	0.436 *11,07*	0.01/0.03 *0,3/0,8*	8	0.19 *86*
7,94..9	9/16-18 *14,29-18*	2.41 *61,3*	3.150 *80*	0.126 *3,2*	0.478 *12,14*	0.01/0.03 *0,3/0,8*	8	0.23 *103*
7,94..10	5/8-18 *15,87-18*	2.57 *65,3*	3.268 *83*	0.126 *3,2*	0.539 *13,7*	0.01/0.03 *0,3/0,8*	8	0.25 *114*

Designation system

Examples:	ZXCN6,35-6GKG81 CN6,35E10	

ZX CN 6,35 - 6 G K G81

Material and surface treatment

	Inner ring and ball	**Rod end body**
No code	Bearing steel	Cadmium plated steel
S1)	Bearing steel	Zinc-nickel plated steel
W	Corrosion-resistant steel	Cadmium plated steel
SW1)	Corrosion-resistant steel	Zinc-nickel plated steel
X1)	Corrosion-resistant steel	Corrosion-resistant steel
ZX1)	Corrosion-resistant steel	Cadmium plated corrosion-resistant steel
SZX1)	Corrosion-resistant steel	Zinc-nickel plated corrosion-resistant steel

Basic designation

Bore code

Shield and seal

-	Shielded
E	Sealed

Thread direction

No code	Right-hand thread
G	Left-hand thread

Keyway

No code1)	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

Lubricant

No code	Grease G354 Type 1
G74	Grease MIL PRF 23827 type II
G81	Grease G395

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1) SKF option

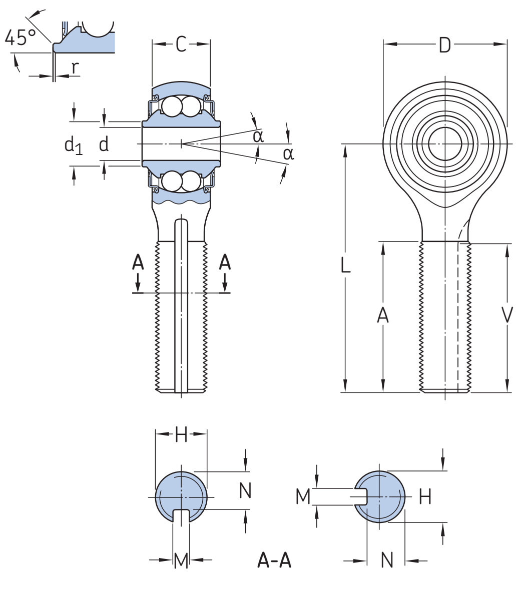
Loads, torque and clearance

Nominal bore code	**Limit static loads** Radial C_s	Axial C_a	**Rotational torque max** Shielded	Sealed	**Swivelling torque** max	**Internal Clearances** Radial	Axial max
–	lbf/*kN*		oz.in/*mN.m*			in/*mm*	
7,94..5	2 424	764	0.708	1.416	28.322	0.00004/0.0002	0.003
	10,8	*3,4*	*5,0*	*10,0*	*200*	*0,001/0,005*	*0,080*
7,94..6	2 424	764	0.708	1.416	28.322	0.00004/0.0002	0.003
	10,8	*3,4*	*5,0*	*10,0*	*200*	*0,001/0,005*	*0,080*
7,94..7	2 424	764	0.708	1.416	28.322	0.00004/0.0002	0.003
	10,8	*3,4*	*5,0*	*10,0*	*200*	*0,001/0,005*	*0,080*
7,94..8	2 424	764	0.708	1.416	28.322	0.00004/0.0002	0.003
	10,8	*3,4*	*5,0*	*10,0*	*200*	*0,001/0,005*	*0,080*
7,94..9	2 424	764	0.708	1.416	28.322	0.00004/0.0002	0.003
	10,8	*3,4*	*5,0*	*10,0*	*200*	*0,001/0,005*	*0,080*
7,94..10	2 424	764	0.708	1.416	28.322	0.00004/0.0002	0.003
	10,8	*3,4*	*5,0*	*10,0*	*200*	*0,001/0,005*	*0,080*

3.15 External thread rod end with integrated rolling bearing (inch dimensions)

CN.. bore code **9,52..6** to **9,52..10**

Technical specification	EN 2067
Product standard	EN 4156 (bearing in corrosion-resistant steel) EN 4157 (bearing in bearing steel)



Keyway type 1 Keyway type 2

Dimensions

Nominal bore code	Dimensions d	Δdmp	Δds	D ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A Min	d_1 ≈
–	in/*mm*							
9,52..6	0.3750 *9,525*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.260 *32*	0.787 *20*	0.551 *14*	1.457 *37*	0.54 *13,8*
9,52..7	0.3750 *9,525*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.260 *32*	0.787 *20*	0.551 *14*	1.654 *42*	0.54 *13,8*
9,52..8	0.3750 *9,525*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.260 *32*	0.787 *20*	0.551 *14*	2.047 *52*	0.54 *13,8*
9,52..9	0.3750 *9,525*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.260 *32*	0.787 *20*	0.551 *14*	1.890 *48*	0.54 *13,8*
9,52..10	0.3750 *9,525*	0/–0.003 *0/–0,008*	0/–0.005 *0/–0,013*	1.260 *32*	0.787 *20*	0.551 *14*	2.480 *63*	0.54 *13,8*

Dimensions cont.

Nominal bore code	Dimensions H UNJF-3A	V ±0.02 *±0,5*	L ±0.010 *±0,25*	M +0.005/0 *+0,127/0*	N +0.005/0 *+0,127/0*	r	α	Mass ≈
–	–	in/*mm*					°	lb/*g*
9,52..6	3/8-24 *9,52-24*	1.55 *39,3*	2.441 *62*	0.095 *2,4*	0.311 *7,9*	0.01/0.03 *0,3/0,8*	8	0.21 *94*
9,52..7	7/16-20 *11,11-20*	1.74 *44,3*	2.638 *67*	0.095 *2,4*	0.370 *9,4*	0.01/0.03 *0,3/0,8*	8	0.23 *106*
9,52..8	1/2-20 *12,7-20*	2.14 *54,3*	2.953 *75*	0.095 *2,4*	0.436 *11,07*	0.01/0.03 *0,3/0,8*	8	0.27 *122*
9,52..9	9/16-18 *14,29-18*	1.98 *50,3*	2.874 *73*	0.126 *3,2*	0.478 *12,14*	0.01/0.03 *0,3/0,8*	8	0.29 *132*
9,52..10	5/8-18 *15,87-18*	2.57 *65,3*	3.346 *85*	0.126 *3,2*	0.539 *13,7*	0.01/0.03 *0,3/0,8*	8	0.317 *144*

Designation system

Examples: ZXCN6,35-6GKG81
CN6,35E10

ZX	CN	6,35	-	6	G	K	G81

Material and surface treatment

	Inner ring and ball	**Rod end body**
No code	Bearing steel	Cadmium plated steel
S1)	Bearing steel	Zinc-nickel plated steel
W	Corrosion-resistant steel	Cadmium plated steel
SW1)	Corrosion-resistant steel	Zinc-nickel plated steel
X1)	Corrosion-resistant steel	Corrosion-resistant steel
ZX1)	Corrosion-resistant steel	Cadmium plated corrosion-resistant steel
SZX1)	Corrosion-resistant steel	Zinc-nickel plated corrosion-resistant steel

Basic designation

Bore code

Shield and seal

-	Shielded
E	Sealed

Thread direction

No code	Right-hand thread
G	Left-hand thread

Keyway

No code1)	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

Lubricant

No code	Grease G354 Type 1
G74	Grease MIL PRF 23827 type II
G81	Grease G395

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1) SKF option

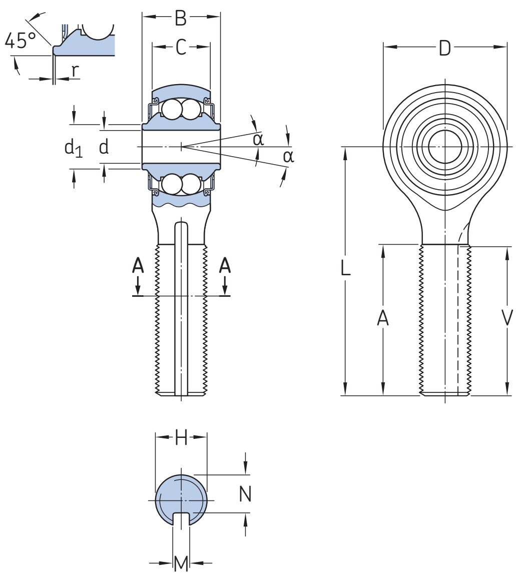
Loads, torque and clearance

Nominal bore code	**Limit static loads** Radial C_s	Axial C_a	**Rotational torque max** Shielded	Sealed	**Swivelling torque** max	**Internal Clearances** Radial	Axial max
–	lbf/*kN*		oz.in/*mN.m*			in/*mm*	
9,52..6	3 147	989	0.991	1.699	28.322	0.00004/0.0002	0.003
	14	*4,4*	*7,0*	*12,0*	*200*	*0,001/0,005*	*0,080*
9,52..7	3 147	989	0.991	1.699	28.322	0.00004/0.0002	0.003
	14	*4,4*	*7,0*	*12,0*	*200*	*0,001/0,005*	*0,080*
9,52..8	3 147	989	0.991	1.699	28.322	0.00004/0.0002	0.003
	14	*4,4*	*7,0*	*12,0*	*200*	*0,001/0,005*	*0,080*
9,52..9	3 147	989	0.991	1.699	28.322	0.00004/0.0002	0.003
	14	*4,4*	*7,0*	*12,0*	*200*	*0,001/0,005*	*0,080*
9,52..10	3 147	989	0.991	1.699	28.322	0.00004/0.0002	0.003
	14	*4,4*	*7,0*	*12,0*	*200*	*0,001/0,005*	*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



Dimensions

Nominal bore code Without keyway	 With keyway	**Dimensions** d 0/–0.0003 *0/–0,008*	 D ±0.010 *±0,254*	 B 0/–0.005 *0/–0,127*	 C ±0.010 *±0,254*	 A ±0.031 *±0,787*	 V +0.02/0 *+0,5/0*	 d$_1$ ≈	 r +0.015/0 *+ 0,381/0*	 H UNJF-3A
–		in/*mm*								–
REP3M..3	**–**	0.1900 *4,826*	0.781 *19,837*	0.437 *11,100*	0.328 *8,331*	0.750 *19,05*	0.750 *19,05*	0.276 *7,01*	0.005 *0,127*	10-32
REP3M..5	**–**	0.1900 *4,826*	0.781 *19,837*	0.437 *11,100*	0.328 *8,331*	0.750 *19,05*	0.750 *19,05*	0.276 *7,01*	0.005 *0,127*	3/16-32
REP3M..4-6	**REP3M..S4-6**	0.1900 *4,826*	0.781 *19,837*	0.437 *11,100*	0.328 *8,331*	1.000 *25,40*	1.000 *25,40*	0.276 *7,01*	0.005 *0,127*	1/4-28
REP3M..6-2N	**REP3MS..6-2N**[2] **REP3M..S6**[3]	0.1900 *4,826*	0.781 *19,837*	0.437 *11,100*	0.328 *8,331*	0.750 *19,05*	0.750 *19,05*	0.276 *7,01*	0.005 *0,127*	3/8-24
RAP3M..4-2	**RAP3M..S4-2**	0.1900 *4,826*	0.781 *19,837*	0.500 *12,700*	0.438 *11,125*	0.938 *23,825*	0.938 *23,825*	0.307 *7,80*	0.005 *0,127*	1/4-28
–	**RA3M..5**[1]	0.1900 *4,826*	0.781 *19,837*	0.562 *14,275*	0.438 *11,125*	1.375 *34,925*	1.375 *34,925*	0.307 *7,80*	0.005 *0,127*	5/16-24
REP3M..6A	**REP3M..S6A**	0.1900 *4,826*	0.969 *24,613*	0.500 *12,700*	0.407 *10,338*	1.313 *33,350*	1.313 *33,350*	0.299 *7,59*	0.005 *0,127*	3/8-24
REP4M..6	**REP4M..6-4**	0.2500 *6,350*	0.938 *23,825*	0.593 *15,062*	0.438 *11,125*	1.125 *28,575*	1.125 *28,575*	0.340 *8,64*	0.005 *0,127*	3/8-24
–	**RA4M..7**[1]	0.2500 *6,350*	0.938 *23,825*	0.687 *17,450*	0.531 *13,487*	1.625 *41,275*	1.625 *41,275*	0.430 *10,92*	0.005 *0,127*	7/16-20
REP5M..6	**REP5M..6-2**	7.938 *7,938*	31.750 *31,750*	22.100 *22,100*	16.662 *16,662*	39.700 *39,700*	39.700 *39,700*	0.501 *12,73*	0.015 *0,381*	3/8-24
REP5M..7	**REP5M..S7**	0.3125 *7,938*	1.250 *31,750*	0.870 *22,100*	0.656 *16,662*	1.563 *39,700*	1.563 *39,700*	0.501 *12,73*	0.015 *0,381*	7/16-20
REP5M..10	**REP5M..S10**	0.3125 *7,938*	1.250 *31,750*	0.870 *22,100*	0.656 *16,662*	1.563 *39,700*	1.563 *39,700*	0.501 *12,73*	0.015 *0,381*	5/8-18
REP8M..10[1]	**–**	0.5000 *12,700*	1.875 *47,625*	1.000 *25,400*	0.844 *21,438*	1.750 *44,450*	1.750 *44,450*	0.775 *19,68*	0.015 *0,381*	5/8-18
RAP10M..10	**RAP10M..S10**	0.6250 *0,6250*	2.000 *2,000*	1.125 *1,125*	0.938 *0,938*	1.500 *1,500*	1.500 *1,500*	0.875 *22,23*	0.015 *0,381*	5/8-18

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[1] SKF option [2] For right-hand thread [3] For left-hand thread

Designation system

Examples: XREP4ML6-4S181CP199
RA3M5SK1

X REP4M L 6-4 S181 CP199

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
W1)	Corrosion-resistant steel	Cadmium plated steel
SW1)	Corrosion-resistant steel	Zinc-nickel plated steel
X1)	Corrosion-resistant steel	Corrosion-resistant steel

Basic designation

Thread direction

No code2)	Right-hand thread
R3)	Right-hand thread
L	Left-hand thread

Lubricant

SK1	Grease G354
S181	Grease G395

Shield and seal

No code	Sealed
CP1991)	Shielded

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1) SKF option
2) For bore codes other than REP3..3
3) For bore code REP3..3

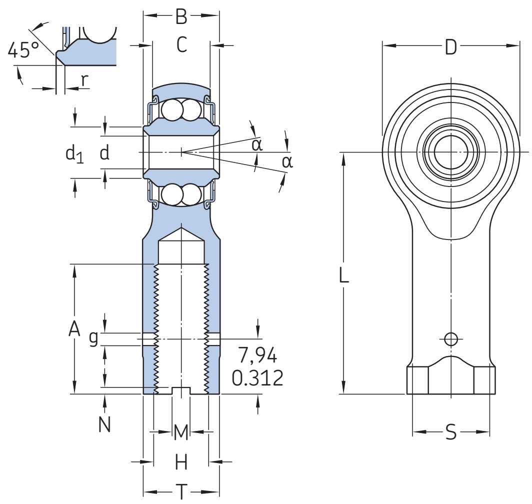
Dimensions cont. loads, torque and clearance

Nominal bore code		**Dimensions**				**Mass**	**Limit static loads**		**Max internal Clearances**		**Rotational torque max**
Without keyway	With keyway	L ±0.010 *±0,254*	M +0.005/0 *+ 0,127/0*	N 0/–0.005 *0/–0,127*	α	≈	Radial C_s	Axial C_a	Radial	Axial	
–		in/*mm*			°	lb/*g*	lbf/*kN*		in/*mm*		oz.in/*mN.m*
REP3M..3	**–**	1.375 *34,925*	–	–	10	0.04 *18*	1 000 *4,4*	200 *0,89*	0.0004 *0,0101*	0.003 *0,0762*	3 *21,18*
REP3M..5	**–**	1.375 *34,925*	–	–	10	0.04 *18*	1 000 *4,4*	200 *0,89*	0.0004 *0,0101*	0.003 *0,0762*	3 *21,18*
REP3M..4-6	**REP3M..S4-6**	1.563 *39,700*	0.062 *1,574*	0.20 *5,105*	10	0.05 *23*	1 000 *4,4*	200 *0,9*	0.0004 *0,0101*	0.003 *0,0762*	3 *21,18*
REP3M..6-2N	**REP3MS..6-2N**2) **REP3M..S6**3)	1.375 *34,925*	0.093 *2,362*	0.311 *7,89*	10	0.05 *23*	1 000 *4,4*	200 *0,89*	0.0004 *0,0101*	0.003 *0,0762*	3 *21,18*
RAP3M..4-2	**RAP3M..S4-2**	1.812 *46,025*	0.062 *1,574*	0.20 *5,105*	10	0.10 *45*	1 000 *4,4*	200 *0,9*	0.0004 *0,0101*	0.003 *0,0762*	3 *21,18*
–	**RA3M..5**1)	1.938 *49,225*	0.062 *1,574*	0.260 *6,60*	10	0.07 *32*	1 000 *4,4*	240 *1,07*	0.0004 *0,0101*	0.003 *0,0762*	3 *21,18*
REP3M..6A	**REP3M..S6A**	2.031 *51,587*	0.093 *2,362*	0.311 *7,899*	10	0.115 *52*	1 200 *5,3*	240 *1,07*	0.0004 *0,0101*	0.003 *0,0762*	3 *21,18*
REP4M..6	**REP4M..6-4**	1.875 *47,625*	0.093 *2,362*	0.311 *7,899*	10	0.10 *45*	1 720 *7,65*	345 *1,53*	0.0004 *0,0101*	0.003 *0,0762*	4 *28,24*
–	**RA4M..7**1)	2.250 *57,150*	0.093 *2,362*	0.370 *9,328*	10	0.13 *59*	1 720 *7,65*	345 *1,53*	0.0004 *0,0101*	0.003 *0,0762*	4 *28,24*
REP5M..6	**REP5M..6-2**	61.925 *61,925*	0.093 *2,362*	0.311 *7,899*	10	109 *109*	2 920 *12,90*	585.00 *2,60*	0.0004 *0,0101*	0.003 *0,0762*	6 *42,36*
REP5M..7	**REP5M..S7**	2.438 *61,925*	0.093 *2,362*	0.370 *9,328*	10	0.24 *109*	2 920 *12,90*	585 *2,60*	0.0004 *0,0101*	0.003 *0,0762*	6 *42,36*
REP5M..10	**REP5M..S10**	2.438 *61,925*	0.125 *3,175*	0.541 *13,741*	10	0.24 *109*	2 920 *12,90*	585 *2,60*	0.0004 *0,0101*	0.003 *0,0762*	6 *42,36*
REP8M..101)	**–**	3.031 *76,987*	– –	– –	10	0.55 *249*	6 900 *30,5*	1 380 *6,1*	0.0004 *0,0101*	0.003 *0,0762*	8 *56,48*
RAP10M..10	**RAP10M..S10**	2.750 *2,750*	0.125 *3,175*	0.541 *13,741*	10	0.71 *0,71*	7 090 *32*	1 420 *6,32*	0.0004 *0,0101*	0.003 *0,0762*	8 *56,48*

3.17 Internal thread rod end with integrated rolling bearing (inch dimensions)

REP, REP..F, REP..B..N..

Technical specification	AS 6039
Product standard	AS 21153



Dimensions

Nominal bore code	Dimensions										
	d 0/–0.0003 *0/–0,008*	D ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	C ±0.010 *±0,254*	A ±0.031 *±0,79*	r +0.015/0 *+0,381/0*	g ≈	d_1 ≈	H UNJF-3B	L ±0.010 *±0,254*	S ±0.010 *±0,254*
–	in/*mm*								–	in/*mm*	
B3N1) **3F...4-3**2)	0.1900 *4,826*	0.781 *19,837*	0.437 *11,100*	0.328 *8,331*	0.812 *20,625*	0.005 *0,127*	0.07 1,778	0.276 *7,01*	1/4-28	1.375 *34,925*	0.375 *9,525*
B3N-2	0.1900 *4,826*	0.781 *19,837*	0.437 *11,100*	0.328 *8,331*	0.812 *20,625*	0.005 *0,127*	0.07 1,778	0.276 *7,01*	5/16-24	1.375 *34,925*	0.438 *11,125*
3F..4	0.1900 *4,826*	0.781 *19,837*	0.500 *12,700*	0.328 *8,331*	0.812 *20,625*	0.005 *0,127*	0.07 1,778	0.276 *7,01*	1/4-28	1.375 *34,925*	0.375 *9,525*
4F..5	0.2500 *6,350*	0.938 *23,825*	0.593 *15,062*	0.438 *11,125*	0.812 *20,625*	0.005 *0,127*	0.07 1,778	0.340 *8,63*	5/16-24	1.469 *37,313*	0.438 *11,125*
4F..7	0.2500 *6,350*	0.938 *23,825*	0.593 *15,062*	0.438 *11,125*	1.125 *28,575*	0.015 *0,381*	0.07 1,778	0.340 *8,63*	7/16-20	1.875 *47,625*	0.625 *15,875*
5F..5	0.3125 *7,938*	1.250 *31,750*	0.870 *22,100*	0.656 *16,662*	1.000 *25,400*	0.015 *0,381*	0.07 1,778	0.501 *12,72*	5/16-24	1.875 *47,625*	0.438 *11,125*

1) For right-hand thread
2) For left-hand thread

Designation system

Examples: XREP4FL5KS181CP199
REPB3NSK1

X REP 4 F L 5 K S181 CP199

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[3]	Corrosion-resistant steel	Cadmium plated steel
SW[3]	Corrosion-resistant steel	Zinc-nickel plated steel
X[3]	Corrosion-resistant steel	Corrosion-resistant steel

Basic designation

Bore code

Thread direction

No code	Right-hand thread
L[5]	Left-hand thread

Keyway

No code	Without keyway
K[4]	With keyway

Lubricant

SK1	Grease G354
S181	Grease G395

Shield and seal

No code	Sealed
CP199[3]	Shielded

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[3] SKF option
[4] Only available for bore code 4..5
[5] Not available for bore code B3N-2

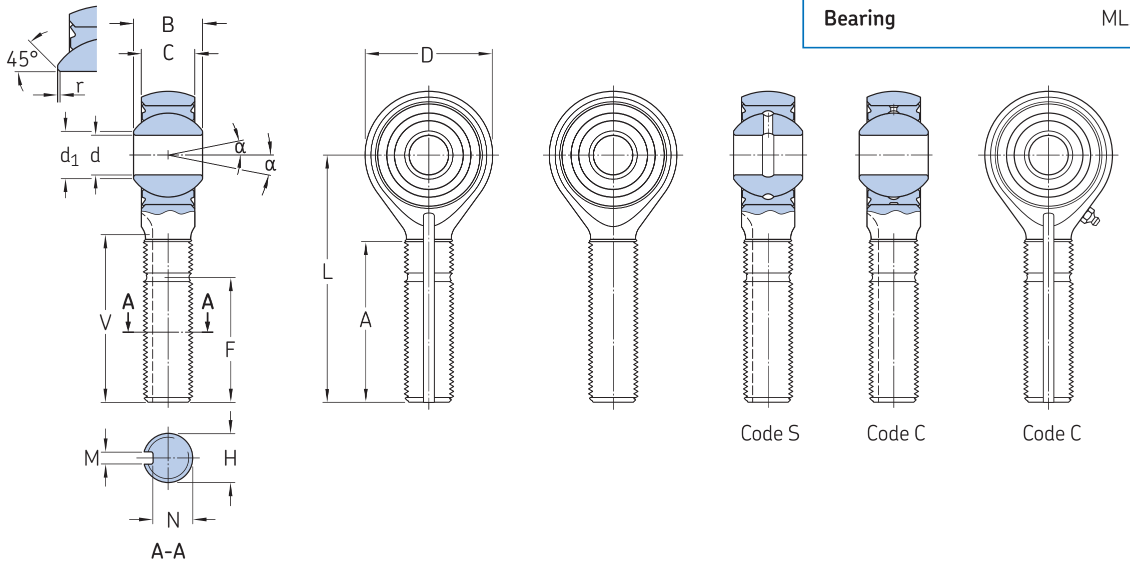
Dimensions cont. loads, torque and clearance

Nominal bore code	Dimensions T ±0.010 *±0,254*	 M +0.005/0 *+ 0,127/0*	 N 0/–0.005 *0/–0,127*	 α	Mass ≈	Limit static loads Radial C_s	 Axial C_a	Maximum Starting Torque	Max internal Clearances Radial	 Axial
–	in/*mm*			°	lb/*g*	lbf/*kN*		oz.in/*mN.m*	in/*mm*	
B3N[2] **3F...4-3**[3]	0.438 *11,125*	– –	– –	10	0.05 *23*	1 000 *4,4*	200 *0,89*	3 *21,18*	0.0004 *0,010*	0.003 *0,076*
B3N-2	0.438 *11,125*	– –	– –	10	0.06 *27*	1 000 *4,4*	200 *0,89*	3 *21,18*	0.0004 *0,010*	0.003 *0,076*
3F..4	0.438 *11,125*	– –	– –	10	0.06 *27*	1 000 *4,4*	200 *0,89*	3 *21,18*	0.0004 *0,010*	0.003 *0,076*
4F..5	0.438 *11,125*	0.062 *1,57*	0.056 *1,42*	10	0.07 *32*	1 720 *7,65*	345 *1,53*	4 *28,24*	0.0004 *0,010*	0.003 *0,076*
4F..7	0.625 *15,875*	– –	– –	10	0.08 *36*	1 720 *7,65*	345 *1,53*	4 *28,24*	0.0004 *0,010*	0.003 *0,076*
5F..5	0.438 *11,125*	– –	– –	10	0.10 *45*	2 920 *12,90*	585 *2,60*	6 *42,36*	0.0004 *0,010*	0.003 *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 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A +0.06/–0.03 *+1,524/–0,762*	V 0/–0,020 *0/–0,508*	d_1 ≈	r ±0.005 *±0,127*	H UNJF-3A
–		in/*mm*								–
4,83	**03**	0.1900 *4,826*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	1.000 *25,400*	1.000 *25,400*	0.300 *7,620*	0.010 *0,254*	5/16-24 *7,94-24*
6,35	**04**	0.2500 *6,350*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	1.000 *25,400*	1.000 *25,400*	0.300 *7,620*	0.010 *0,254*	5/16-24 *7,94-24*
7,94	**05**	0.3125 *7,937*	0.900 *22,860*	0.437 *11,100*	0.327 *8,306*	1.062 *26,975*	1.062 *26,975*	0.360 *9,140*	0.010 *0,254*	5/16-24 *7,94-24*
9,52	**06**	0.3750 *9,525*	1.025 *26,035*	0.500 *12,700*	0.416 *10,566*	1.250 *31,750*	1.250 *31,750*	0.466 *11,840*	0.010 *0,254*	3/8-24 *9,52-24*
11,11	**07**	0.4375 *11,112*	1.150 *29,210*	0.562 *14,275*	0.452 *11,481*	1.375 *34,925*	1.375 *34,925*	0.537 *13,64*	0.010 *0,254*	7/16-20 *11,11-20*
12,7	**08**	0.5000 *12,700*	1.337 *33,960*	0.625 *15,875*	0.515 *13,081*	1.500 *38,100*	1.500 *38,100*	0.607 *15,420*	0.010 *0,254*	1/2-20 *12,7-20*
15,87	**10**	0.6250 *15,875*	1.525 *38,735*	0.750 *19,050*	0.577 *14,656*	1.625 *41,275*	1.625 *41,275*	0.747 *18,970*	0.010 *0,254*	5/8-18 *15,87-18*
19,05	**12**	0.7500 *19,050*	1.775 *45,085*	0.875 *22,225*	0.640 *16,256*	1.750 *44,450*	1.750 *44,450*	0.845 *21,460*	0.010 *0,254*	3/4-16 *19,05-16*
22,22	**14**	0.8750 *22,225*	2.025 *51,435*	0.875 *22,225*	0.765 *19,431*	1.875 *47,625*	1.875 *47,625*	0.995 *25,270*	0.010 *0,254*	7/8-14 *22,22-14*
25,4	**16**	1.0000 *25,400*	2.775 *70,485*	1.375 *34,925*	1.015 *25,781*	2.125 *53,975*	2.125 *53,975*	1.269 *32,230*	0.010 *0,254*	1.1/4-12 *31,75-12*

Designation system

Example: XEMJ/WQMLS6,35RGKX-2
EMJ/WML22,22

X EMJ WQ ML S 6,35 R G K X -2

Rod end body material

No code	Cadmium plated steel
S	Zinc-nickel plated steel
X	Corrosion-resistant steel
T[1]	Anodized titanium

Basic designation

Bearing material

	Inner ring	Outer ring
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

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

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[1] SKF option, masses and load carrying capability reduced compared to steel rod end body

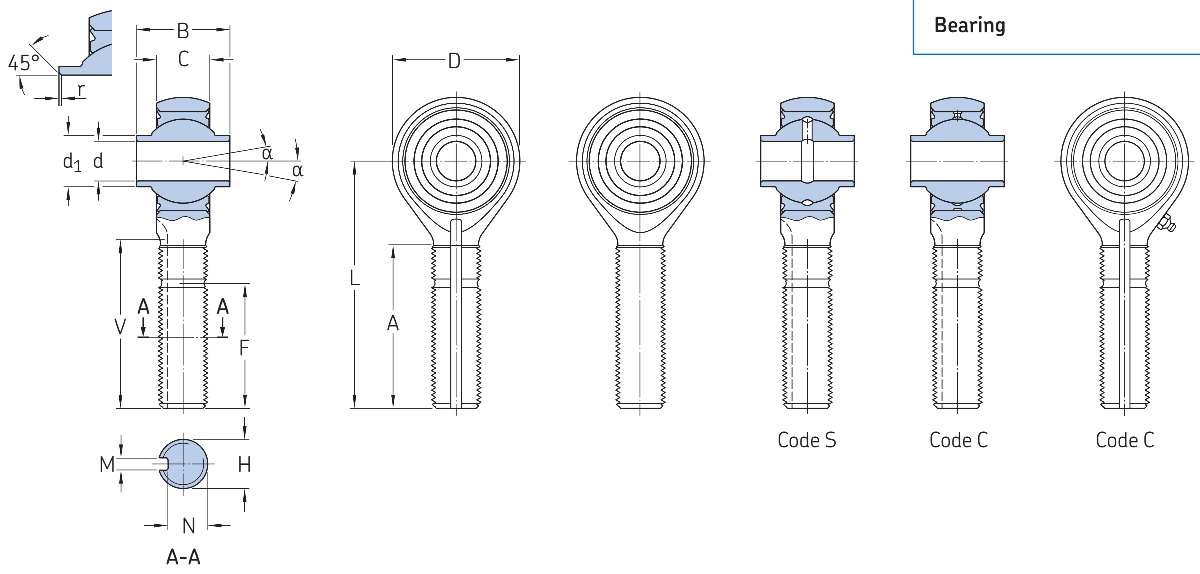
Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions L ±0.010 *±0,254*	M +0.005/0 *+0,127/0*	N 0/–0.0005 *0/–0,0127*	α	Mass ≈	Radial loads Ultimate	Fatigue 10^6 cycles	Axial clearance Standard	Reduced
–		in/*mm*			°	lb/*g*	lbf/*kN*		in/*µm*	
4,83	**03**	1.562 *39,675*	0.062 *1,575*	0.260 *6,604*	16	0.07 *30*	6 195 *27,56*	1 052 *4,68*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
6,35	**04**	1.562 *39,675*	0.062 *1,575*	0.260 *6,604*	16	0.07 *30*	6 195 *27,56*	1 052 *4,68*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
7,94	**05**	1.875 *47,625*	0.062 *1,575*	0.260 *6,604*	15	0.08 *35*	7 585 *33,74*	1 090 *4,85*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
9,52	**06**	1.938 *49,225*	0.093 *2,362*	0.311 *7,90*	9	0.12 *55*	8 940 *39,78*	1 513 *6,73*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
11,11	**07**	2.125 *53,975*	0.093 *2,362*	0.370 *9,40*	11	0.17 *75*	9 595 *42,68*	1 920 *8,54*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
12,7	**08**	2.438 *61,925*	0.093 *2,362*	0.436 *11,074*	9	0.28 *127*	18 750 *83,42*	3 069 *13,65*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
15,87	**10**	2.625 *66,675*	0.125 *3,175*	0.541 *13,741*	12	0.38 *172*	20 680 *91,99*	3 480 *15,48*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
19,05	**12**	2.875 *73,025*	0.125 *3,175*	0.663 *16,840*	13	0.58 *263*	27 795 *123,65*	4 586 *20,40*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
22,22	**14**	3.375 *85,725*	0.156 *3,962*	0.777 *19,735*	6	0.81 *370*	31 725 *141,13*	5 348 *23,79*	0.0012/0.0047 *30/120*	0.0024 max *60 max*
25,4	**16**	4.125 *104,775*	0.187 *4,750*	1.136 *28,854*	12	2.40 *1 100*	71 745 *319,16*	11 990 *53,33*	0.0012/0.0047 *30/120*	0.0024 max *60 max*

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** multiples of 1/16 inch	**Dimensions** d 0/–0.0005 *0/–0,0127*	D +0.035/–0.010 *+0,889/–0,254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A +0.06/–0.03 *+1,524/–0,762*	V 0/–0.020 *0/–0,508*	d_1 ≈	r +0.012/0 *+0,230/0*	H UNJF-3A
–		in/*mm*								–
4,83	**03**	0.1900 *4,826*	0.750 *19,050*	0.500 *12,700*	0.220 *5,588*	1.000 *25,400*	1.000 *25,400*	0.315 *8,000*	0.004 *0,100*	5/16-24 *7,94-24*
6,35	**04**	0.2500 *6,350*	1.000 *25,400*	0.593 *15,062*	0.265 *6,731*	1.250 *31,750*	1.250 *31,750*	0.386 *9,800*	0.004 *0,100*	3/8-24 *9,52-24*
7,94	**05**	0.3125 *7,937*	1.125 *28.575*	0.813 *20,650*	0.355 *9,017*	1.375 *34,925*	1.375 *34,925*	0.512 *13,000*	0.004 *0,100*	7/16-20 *11,11-20*
9,52	**06**	0.3750 *9,525*	1.125 *28,575*	0.813 *20,650*	0.355 *9,017*	1.375 *34,925*	1.375 *34,925*	0.532 *13,500*	0.004 *0,100*	7/16-20 *11,11-20*
11,11	**07**	0.4375 *11,112*	1.312 *33,325*	0.875 *22,225*	0.355 *9,017*	1.500 *38,100*	1.500 *38,100*	0.620 *15,750*	0.004 *0,100*	1/2-20 *12,7-20*
12,7	**08**	0.5000 *12,700*	1.500 *38,100*	0.937 *23,799*	0.411 *10,439*	1.625 *41,275*	1.625 *41,275*	0.728 *18,480*	0.004 *0,100*	5/8-18 *15,87-18*
15,87	**10**	0.6250 *15,875*	1.750 *44,450*	1.200 *30,480*	0.577 *14,656*	1.750 *44,450*	1.750 *44,450*	0.857 *21,770*	0.004 *0,100*	3/4-16 *19,05-16*
19,05	**12**	0.7500 *19,050*	2.000 *50,800*	1.280 *32,512*	0.630 *16,002*	1.875 *47,625*	1.875 *47,625*	0.963 *24,450*	0.004 *0,100*	7/8-14 *22,22-14*
22,22	**14**	0.8750 *22,225*	2.200 *55,880*	1.400 *35,560*	0.635 *16,129*	2.000 *50,800*	2.000 *50,800*	1.122 *28,490*	0.004 *0,100*	7/8-14 *22,22-14*
25,4	**16**	1.0000 *25,400*	2.750 *69,850*	1.875 *47,625*	0.845 *21,463*	2.125 *53,975*	2.125 *53,975*	1.272 *32,320*	0.004 *0,100*	1.1/4-12 *31,75-12*

Designation system

Examples: XEMJ/WQMTS6,35RGKX-2
EMJQMT11,11R

X EMJ WQ MT S 6,35 R G K X –2

Rod end body material

No code	Cadmium plated steel
S	Zinc-nickel plated steel
X	Corrosion-resistant steel
T[1]	Anodized titanium

Basic designation

Bearing material

	Inner ring	Rod end body
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

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

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[1] SKF option, masses and load carrying capability reduced compared to steel rod end body

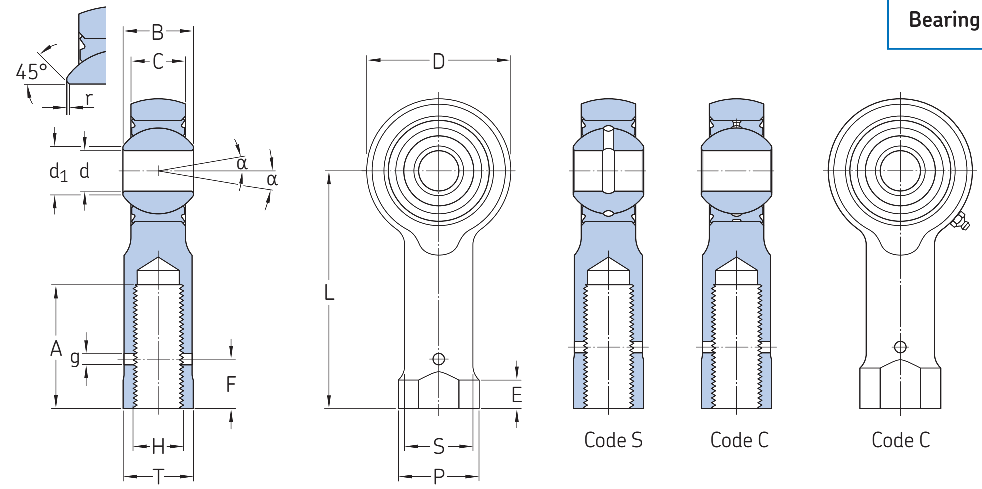
Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions L ±0.010 *±0,254*	M +0.005/0 *+0,127/0*	N 0/–0.0005 *0/–0,0127*	α	Mass ≈	Radial loads Ultimate	Fatigue 10⁶ cycles	Axial clearance Standard	Reduced
–		in/*mm*			°	lb/*g*	lbf/*kN*		in/*μm*	
4,83	**03**	1.500 *38,100*	0.062 *1,575*	0.260 *6,604*	15	0.06 *27*	4 800 *21,35*	762 *3,39*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
6,35	**04**	1.938 *49,225*	0.093 *2,362*	0.311 *7,899*	24	0.11 *50*	8 185 *36,40*	1 311 *5,83*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
7,94	**05**	2.125 *53,975*	0.093 *2,362*	0.370 *9,400*	23	0.16 *73*	8 620 *38,34*	1 414 *6,29*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
9,52	**06**	2,125 *53,975*	0,093 *2,362*	0,370 *9,40*	22	0,16 *73*	8 620 *38,34*	1 414 *6,29*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
11,11	**07**	2,438 *61,925*	0,093 *2,362*	0,436 *11,07*	22	0,25 *114*	13 025 *57,93*	2 104 *9,36*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
12,7	**08**	2,625 *66,675*	0,125 *3,175*	0,541 *13,741*	20	0,41 *186*	18 165 *80,80*	2 947 *13,11*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
15,87	**10**	2,875 *73,025*	0,125 *3,175*	0,663 *16,840*	20	0,64 *290*	24 010 *106,80*	3 973 *17,67*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
19,05	**12**	3,375 *85,725*	0,156 *3,962*	0,777 *19,735*	19	0,92 *417*	26 990 *120,05*	5 052 *22,47*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
22,22	**14**	3,750 *95,250*	0,156 *3,962*	0,777 *19,735*	19	1,11 *508*	28 880 *128,46*	5 295 *23,55*	0.0012/0.0047 *30/120*	0.0024 max *60 max*
25,4	**16**	4,125 *104,775*	0,187 *4,750*	1,136 *28,854*	21	2,14 *970*	60 230 *267,90*	9 858 *43,85*	0.0012/0.0047 *30/120*	0.0024 max *60 max*

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 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A +0.06/–0.03 *+1,524/–0,762*	d_1 ≈	r ±0.005 *±0,127*	g ≈	H UNJF-3B	L ±0.010 *±0,254*
–		in/*mm*								–	in/*mm*
4,83	**03**	0.1900 *4,826*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.750 *19,050*	0.300 *7,620*	0.010 *0,254*	0.07 *1,778*	5/16-24 *7,94-24*	1.375 *34,925*
6,35	**04**	0.2500 *6,350*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.750 *19,050*	0.300 *7,620*	0.010 *0,254*	0.07 *1,778*	5/16-24 *7,94-24*	1.469 *37,312*
7,94	**05**	0.3125 *7,937*	0.900 *22,860*	0.437 *11,100*	0.327 *8,306*	0.750 *19,050*	0.360 *9,140*	0.010 *0,254*	0.07 *1,778*	5/16-24 *7,94-24*	1.375 *34,925*
9,52	**06**	0.3750 *9,525*	1.025 *26,035*	0.500 *12,700*	0.416 *10,566*	0.937 *23,780*	0.466 *11,840*	0.010 *0,254*	0.07 *1,778*	3/8-24 *9,52-24*	1.625 *41,275*
11,11	**07**	0.4375 *11,112*	1.150 *29,210*	0.562 *14,275*	0.452 *11,481*	1.062 *26,975*	0.537 *13,64*	0.010 *0,254*	0.07 *1,778*	7/16-20 *11,11-20*	1.812 *46,025*
12,7	**08**	0.5000 *12,700*	1.337 *33,960*	0.625 *15,875*	0.515 *13,081*	1.125 *28,575*	0.607 *15,420*	0.010 *0,254*	0.07 *1,778*	1/2-20 *12,7-20*	2.125 *53,975*
15,87	**10**	0.6250 *15,875*	1.525 *38,735*	0.750 *19,050*	0.577 *14,656*	1.500 *38,100*	0.747 *18,970*	0.010 *0,254*	0.07 *1,778*	5/8-18 *15,87-18*	2.625 *66,675*
19,05	**12**	0.7500 *19,050*	1.775 *45,085*	0.875 *22,225*	0.640 *16,256*	1.620 *41,148*	0.845 *21,460*	0.010 *0,254*	0.07 *1,778*	3/4-16 *19,05-16*	2.875 *73,025*
22,22	**14**	0.8750 *22,225*	2.025 *51,435*	0.875 *22,225*	0.765 *19,431*	1.875 *47,625*	0.995 *25,270*	0.010 *0,254*	0.07 *1,778*	7/8-14 *22,22-14*	3.375 *85,725*
25,4	**16**	1.0000 *25,400*	2.775 *70,485*	1.375 *34,925*	1.015 *25,781*	2.125 *53,975*	1.269 *32,230*	0.010 *0,254*	0.07 *1,778*	1-12 *25,4-12*	4.125 *104,775*

Designation system

Examples:	XEFJ/WQMLS6,35RGX-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[1]	Anodized titanium

Basic designation

Bearing material

	Inner ring	Outer ring
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

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[1] SKF option, masses and load carrying capability reduced compared to steel rod end body

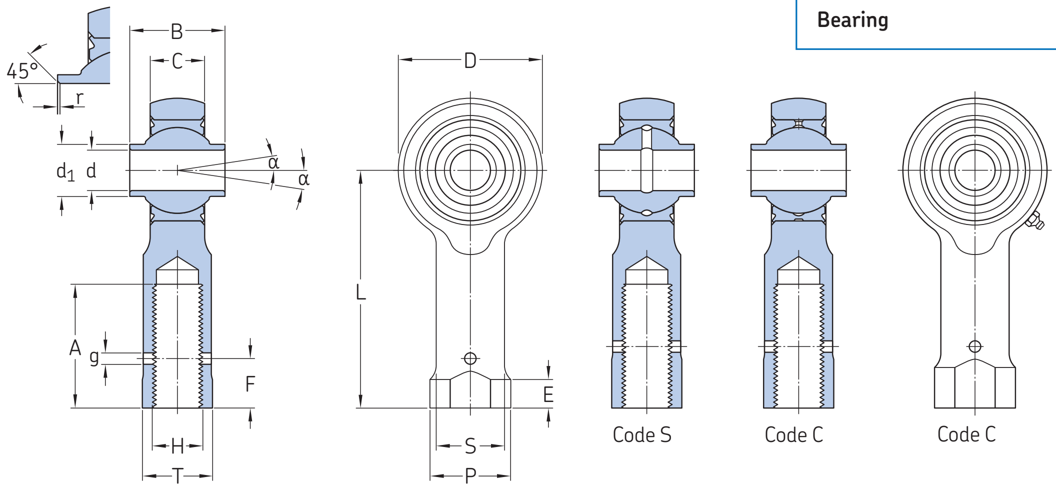
Dimensions cont., loads and clearance

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions						Mass	Radial loads		Axial clearance	
		P ±0.010 *±0,254*	F ±0.015 *±0,381*	E ≈	S ±0.005 *±0,127*	T +0.03/–0.010 *+0,076/–0,254*	α	≈	Ultimate	Fatigue 10^6 cycles	Standard	Reduced
–		in/*mm*					°	lb/*g*	lbf/*kN*		in/*µm*	
4,83	**03**	0.500 *12,700*	0.380 *9,652*	0.25 *6,35*	0.422 *10,719*	0.437 *11,100*	16	0.07 *32*	6 195 *27,56*	1 052 *4,68*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
6,35	**04**	0.500 *12,700*	0.380 *9,652*	0.25 *6,35*	0.422 *10,719*	0.437 *11,100*	16	0.07 *32*	6 195 *27,56*	1 052 *4,68*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
7,94	**05**	0.500 *12,700*	0.380 *9,652*	0.25 *6,35*	0.422 *10,719*	0.437 *11,100*	15	0.10 *45*	7 585 *33,74*	1 090 *4,85*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
9,52	**06**	0.625 *15,875*	0.440 *11,176*	0.25 *6,35*	0.567 *14,402*	0.582 *14,782*	9	0.12 *55*	8 940 *39,78*	1 513 *6,73*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
11,11	**07**	0.687 *17,450*	0.500 *12,700*	0.25 *6,35*	0.610 *15,494*	0.625 *15,875*	11	0.20 *92*	9 595 *42,68*	1 920 *8,54*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
12,7	**08**	0.812 *20,625*	0.560 *14,224*	0.25 *6,35*	0.735 *18,669*	0.750 *19,050*	9	0.28 *140*	18 750 *83,42*	3 069 *13,65*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
15,87	**10**	1.000 *25,400*	0.690 *17,526*	0.25 *6,35*	0.860 *21,844*	0.875 *22,225*	12	0.45 *205*	20 680 *91,99*	3 480 *15,48*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
19,05	**12**	1.060 *26,924*	0.820 *20,828*	0.25 *6,35*	0.985 *25,019*	1.000 *25,400*	13	0.55 *250*	27 795 *123,65*	4 586 *20,40*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
22,22	**14**	1.187 *30,150*	0.940 *23,876*	0.25 *6,35*	1.110 *28,194*	1.125 *28,575*	6	1.00 *450*	31 725 *141,13*	5 348 *23,79*	0.0012/0.0047 *30/120*	0.0024 max *60 max*
25,4	**16**	1,312 *33,325*	1,070 *27,178*	0.25 *6,35*	1,235 *31,369*	1,250 *31,750*	12	1,45 *660*	71 745 *319,16*	8 377 *37,26*	0.0012/0.0047 *30/120*	0.0024 max *60 max*

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** multiples of 1/16 inch	**Dimensions** d 0/–0.0005 *0/–0,0127*	D +0.035/–0.010 *+0,889/–0,254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A +0.06/–0.03 *+1,524/–0,762*	d_1 ≈	r +0.012/0 *+0,230/0*	g ≈	H UNJF-3B	L ±0.010 *±0,254*
–		in/*mm*								–	in/*mm*
4,83	**03**	0.1900 *4,826*	0.750 *19,050*	0.500 *12,700*	0.220 *5,588*	0.750 *19,050*	0.315 *8,000*	0.004 *0,100*	0.07 *1,778*	5/16-24 *7,94-24*	1.375 *34,925*
6,35	**04**	0.2500 *6,350*	1.000 *25,400*	0.593 *15,062*	0.265 *6,731*	0.937 *23,780*	0.386 *9,800*	0.004 *0,100*	0.07 *1,778*	3/8-24 *9,52-24*	1.625 *41,275*
7,94	**05**	0.3125 *7,937*	1.125 *28,575*	0.813 *20,650*	0.355 *9,017*	1.062 *26,975*	0.512 *13,000*	0.004 *0,100*	0.07 *1,778*	7/16-20 *11,11-20*	1.812 *46,025*
9,52	**06**	0.3750 *9,525*	1.125 *28,575*	0.813 *20,650*	0.355 *9,017*	1.062 *26,975*	0.532 *13,500*	0.004 *0,100*	0.07 *1,778*	7/16-20 *11,11-20*	1.812 *46,025*
11,11	**07**	0.4375 *11,112*	1.312 *33,325*	0.875 *22,225*	0.355 *9,017*	1.125 *28,575*	0.620 *15,750*	0.004 *0,100*	0.07 *1,778*	1/2-20 *12,7-20*	2.125 *53,975*
12,7	**08**	0.5000 *12,700*	1.500 *38,100*	0.937 *23,799*	0.411 *10,439*	1.500 *38,100*	0.728 *18,480*	0.004 *0,100*	0.07 *1,778*	5/8-18 *15,87-18*	2.625 *66,675*
15,87	**10**	0.6250 *15,875*	1.750 *44,450*	1.200 *30,480*	0.577 *14,656*	1.750 *44,450*	0.857 *21,770*	0.004 *0,100*	0.07 *1,778*	3/4-16 *19,05-16*	2.875 *73,025*
19,05	**12**	0.7500 *19,050*	2.000 *50,800*	1.280 *32,512*	0.630 *16,002*	1.875 *47,625*	0.963 *24,450*	0.004 *0,100*	0.07 *1,778*	7/8-14 *22,22-14*	2.875 *73,025*
22,22	**14**	0.8750 *22,225*	2.200 *55,880*	1.400 *35,560*	0.635 *16,129*	2.000 *50,800*	1.122 *28,490*	0.004 *0,100*	0.07 *1,778*	7/8-14 *22,22-14*	3.375 *85,725*
25,4	**16**	1.0000 *25,400*	2.750 *69,850*	1.875 *47,625*	0.845 *21,463*	2.125 *53,975*	1.272 *32,320*	0.004 *0,100*	0.07 *1,778*	1.1/4-12 *31,75-12*	4.125 *104,775*

Designation system

Examples: XEFJ/WQMTS6,35RGX-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
T1)	Anodized titanium

Basic designation

Bearing material

	Inner ring	**Outer ring**
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

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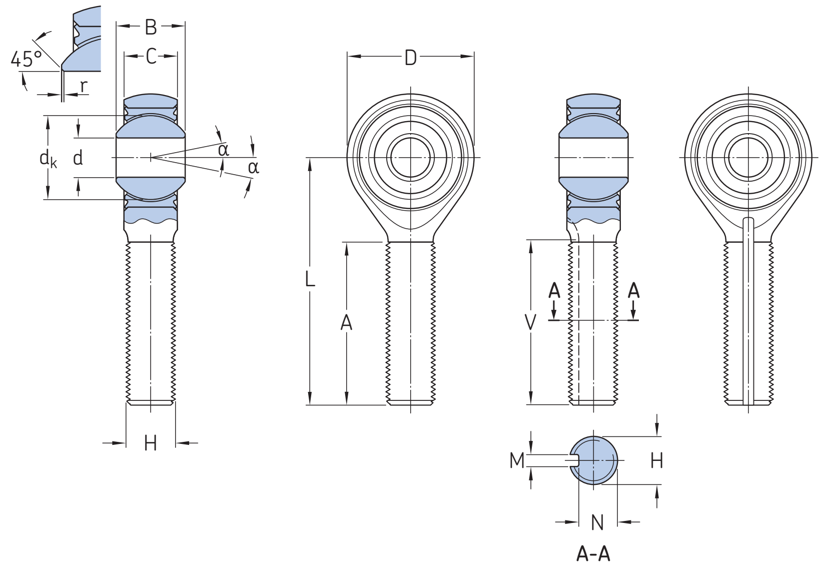
1) SKF option, masses and load carrying capability reduced compared to steel rod end body

Dimensions cont., loads and clearance

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** P ±0.010 *±0,254*	F ±0.015 *±0,381*	E ≈	S ±0.005 *±0,127*	T ±0.010 *±0,254*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 10^6 cycles	**Axial clearance** Standard	Reduced
–		in/*mm*					°	lb/*g*	lbf/*kN*		in/*µm*	
4,83	**03**	0.500 *12,700*	0.380 *9,652*	0.25 *6,35*	0.422 *10,719*	0.437 *11,100*	15	0.07 *31*	4 800 *21,35*	762 *3,39*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
6,35	**04**	0.625 *15,875*	0.440 *11,176*	0.25 *6,35*	0.567 *14,402*	0.582 *14,782*	24	0.13 *60*	8 185 *36,40*	1 311 *5,83*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
7,94	**05**	0.687 *17,450*	0.500 *12,700*	0.25 *6,35*	0.610 *15,494*	0.625 *15,875*	23	0.19 *85*	8 620 *38,34*	1 414 *6,29*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
9,52	**06**	0.687 *17,450*	0.500 *12,700*	0.25 *6,35*	0.610 *15,494*	0.625 *15,875*	22	0.19 *85*	8 620 *38,34*	1 414 *6,29*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
11,11	**07**	0.812 *20,625*	0.560 *14,224*	0.25 *6,35*	0.735 *18,669*	0.750 *19,050*	22	0.31 *140*	13 025 *57,93*	2 104 *9,36*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
12,7	**08**	1.000 *25,400*	0.690 *17,526*	0.25 *6,35*	0.860 *21,844*	0.875 *22,225*	20	0.49 *220*	18 165 *80,80*	2 947 *13,11*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
15,87	**10**	1.060 *26,924*	0.820 *20,828*	0.25 *6,35*	0.985 *25,019*	1.000 *25,400*	20	0.71 *321*	24 010 *106,80*	3 973 *17,67*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
19,05	**12**	1.187 *30,150*	0.940 *23,876*	0.25 *6,35*	1.110 *28,194*	1.125 *28,575*	19	0.97 *440*	26 990 *120,05*	5 052 *22,47*	0.0010/0.0040 *25/100*	0.0020 max *50 max*
22,22	**14**	1.187 *30,150*	0.940 *23,876*	0.25 *6,35*	1.110 *28,194*	1.125 *28,575*	19	1.11 *501*	28 880 *128,46*	5 295 *23,55*	0.0012/0.0047 *30/120*	0.0024 max *60 max*
25,4	**16**	2.020 *51,308*	1.070 *27,178*	0.25 *6,35*	1.688 *42,875*	1.250 *31,750*	21	2.00 *908*	60 230 *267,90*	9 858 *43,85*	0.0012/0.0047 *30/120*	0.0024 max *60 max*

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) EWAS..R inch (PH13.8 inner ring)

Dimensions

Nominal bore code	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0.254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A ±0.031 *±0.79*	d_k ≈	r ±0.005 *±0,127*	H UNJF-3A	L ±0.010 *±0.254*
–	in/*mm*							–	in/*mm*
03	0.1900 *4,826*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.968 *24,587*	*0.530* *13,464*	0.010 *0,254*	5/16-24 *7,94-24*	1.562 *39,675*
04	0.2500 *6,350*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.968 *24,587*	*0.530* *13,464*	0.010 *0,254*	5/16-24 *7,94-24*	1.562 *39,675*
05	0.3125 *7,937*	0.900 *22,860*	0.437 *11,100*	0.327 *8,306*	1.187 *30,150*	*0.566* *14,381*	0.010 *0,254*	5/16-24 *7,94-24*	1.875 *47,625*
06	0.3750 *9,525*	1.025 *26,035*	0.500 *12,700*	0.416 *10,566*	1.187 *30,150*	*0.683* *17,361*	0.010 *0,254*	3/8-24 *9,52-24*	1.938 *49,225*
07	0.4375 *11,112*	1.150 *29,210*	0.562 *14,275*	0.452 *11,481*	1.281 *32,537*	*0.777* *19,744*	0.010 *0,254*	7/16-20 *11,11-20*	2.125 *53,975*
08	0.5000 *12,700*	1.337 *33,960*	0.625 *15,875*	0.515 *13,081*	1.468 *37,287*	*0.871* *22,130*	0.010 *0,254*	1/2-20 *12,7-20*	2.438 *61,925*
10	0.6250 *15,875*	1.525 *38,735*	0.750 *19,050*	0.577 *14,656*	1.562 *39,675*	*1.059* *26,887*	0.010 *0,254*	5/8-18 *15,87-18*	2.625 *66,675*
12	0.7500 *19,050*	1.775 *45,085*	0.875 *22,225*	0.640 *16,256*	1.687 *42,850*	*1.216* *30,897*	0.010 *0,254*	3/4-16 *19,05-16*	2.875 *73,025*
14	0.8750 *22,225*	2.025 *51,435*	0.875 *22,225*	0.765 *19,431*	2.000 *50,800*	*1.325* *33,655*	0.010 *0,254*	7/8-14 *22,22-14*	3.375 *85,725*
16	1.0000 *25,400*	2.775 *70,485*	1.375 *34,925*	1.015 *25,781*	2.343 *59,512*	*1.871* *47,526*	0.010 *0,254*	1 1/4-12 *31,75-12*	4.125 *104,775*

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[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

S E MJ/WAS 04 G K

Rod end body material and surface treatment

No code	Cadmium plated 4340 steel
S[2]	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

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[2] SKF option

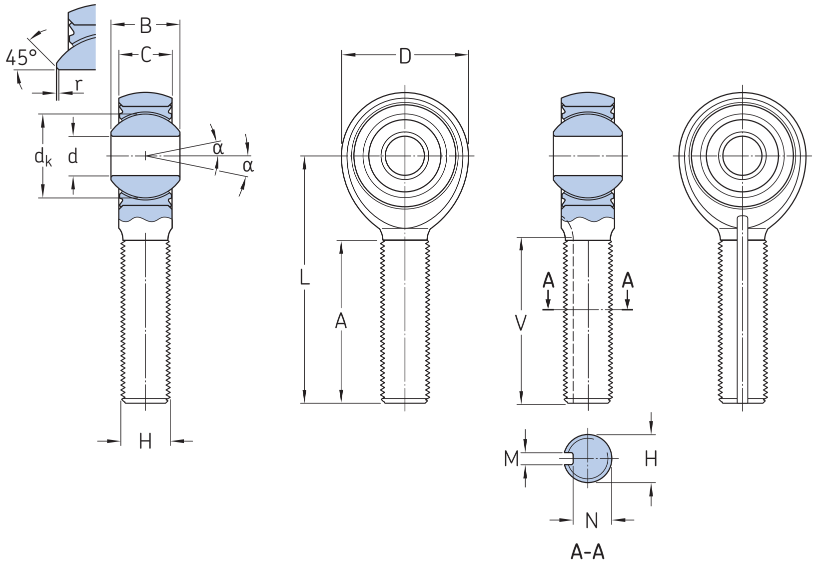
Dimensions cont., loads and torque

Nominal bore code	**Dimensions** M +0.005/0 *+0,127/0*	N 0/–0.005 *0/–0,127*	V 0/–0.020 *0/–0,508*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*			°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.062 *1,575*	0.268 *6,807*	0.980 *24,892*	15	0.072 *33*	2 360 *10,50*	1 470 *6,54*	0.5/6 *0,056/0,678*
04	0.062 *1,575*	0.268 *6,807*	0.980 *24,892*	15	0.072 *33*	4 860 *21,62*	2 380 *10,59*	0.5/6 *0,056/0,678*
05	0.062 *1,575*	0.268 *6,807*	1.270 *32,258*	14	0.087 *39*	7 180 *31,95*	2 770 *12,32*	1/15 *0.113/1,695*
06	0.093 *2,362*	0.319 *8,103*	1.235 *31,369*	8	0.136 *62*	8 550 *38,05*	3 570 *15,88*	1/15 *0,113/1,695*
07	0.093 *2,362*	0.383 *9,728*	1.402 *35,611*	10	0.188 *83*	12 000 *53,4*	4 800 *21,35*	1/15 *0,113/1,695*
08	0.093 *2,362*	0.445 *11,303*	1.589 *40,361*	9	0.278 *126*	19 500 *86,70*	7 680 *34,16*	1/15 *0,113/1,695*
10	0.125 *3,175*	0.541 *13,741*	1.683 *42,748*	12	0.424 *192*	21 900 *97,45*	9 180 *40,83*	1/15 *0,113/1,695*
12	0.125 *3,175*	0.663 *16,840*	1.808 *45,923*	13	0.639 *290*	29 300 *130,38*	11 600 *51,60*	1/15 *0,113/1,695*
14	0.156 *3,962*	0.777 *19,736*	2.121 *53,873*	6	0.963 *437*	34 500 *153,52*	13 100 *58,27*	1/24 *0,113/2,712*
16	0.187 *4,750*	1.136 *28,854*	2.464 *62,586*	12	2.546 *1 150*	80 300 *357,31*	30 400 *135,22*	1/24 *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)

Technical specification	AS 81935
Product standard	AS 81935/6
Rod end material	PH13.8 passivated
Bearing	WAS..R inch (440C inner ring) EWAS..R inch (PH13.8 inner ring)



Dimensions

Nominal bore code	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0.254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A ±0.031 *±0.79*	d_k ≈	r ±0.005 *±0,127*	H UNJF-3A	L ±0.010 *±0.254*
–	in/*mm*							–	in/*mm*
03	0.1900	0.806	0.437	0.337	0.968	0.530	0.010	5/16-24	1.562
	4,826	*20,472*	*11,100*	*8,56*	*24,587*	*13,464*	*0,254*	*7,94-24*	*39,675*
04	0.2500	0.806	0.437	0.337	0.968	0.530	0.010	5/16-24	1.562
	6,350	*20,472*	*11,100*	*8,56*	*24,587*	*13,464*	*0,254*	*7,94-24*	*39,675*
05	0.3125	0.900	0.437	0.327	1.187	0.566	0.010	5/16-24	1.875
	7,937	*22,860*	*11,100*	*8,306*	*30,150*	*14,381*	*0,254*	*7,94-24*	*47,625*
06	0.3750	1.025	0.500	0.416	1.187	0.683	0.010	3/8-24	1.938
	9,525	*26,035*	*12,700*	*10,566*	*30,150*	*17,361*	*0,254*	*9,52-24*	*49,225*
07	0.4375	1.150	0.562	0.452	1.281	0.777	0.010	7/16-20	2.125
	11,112	*29,210*	*14,275*	*11,481*	*32,537*	*19,744*	*0,254*	*11,11-20*	*53,975*
08	0.5000	1.337	0.625	0.515	1.468	0.871	0.010	1/2-20	2.438
	12,700	*33,960*	*15,875*	*13,081*	*37,287*	*22,130*	*0,254*	*12,7-20*	*61,925*
10	0.6250	1.525	0.750	0.577	1.562	1.059	0.254	5/8-18	2.625
	15,875	*38,735*	*19,050*	*14,656*	*39,675*	*26,887*	*0,010*	*15,87-18*	*66,675*
12	0.7500	1.775	0.875	0.640	1.687	1.216	0.010	3/4-16	2.875
	19,050	*45,085*	*22,225*	*16,256*	*42,850*	*30,897*	*0,254*	*19,05-16*	*73,025*
14	0.8750	2.025	0.875	0.765	2.000	1.325	0.010	7/8-14	3.375
	22,225	*51,435*	*22,225*	*19,431*	*50,800*	*33,655*	*0,254*	*22,22-14*	*85,725*
16	1.0000	2.775	1.375	1.015	2.343	1.871	0.010	1 1/4-12	4.125
	25,400	*70,485*	*34,925*	*25,781*	*59,512*	*47,526*	*0,254*	*31,75-12*	*104,775*

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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

E PHMJ/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

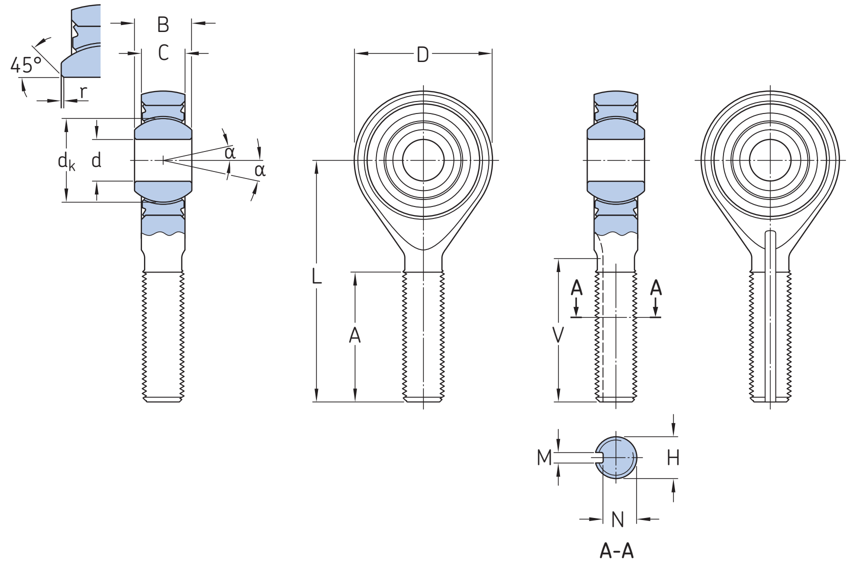
Dimensions cont., loads and torque

Nominal bore code	Dimensions M +0.005/0 *+0,127/0*	 N 0/–0.005 *0/–0,127*	 V 0/–0.020 *0/–0,508*	α	Mass ≈	Radial loads Ultimate	 Fatigue 50 000 cycles	Starting torque
–	in/*mm*			°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.062 *1,575*	0.268 *6,807*	0.980 *24,892*	15	0.072 *33*	2 360 *10,50*	1 470 *6,54*	0.5/6 *0,056/0,678*
04	0.062 *1,575*	0.268 *6,807*	0.980 *24,892*	15	0.072 *33*	4 860 *21,62*	2 380 *10,59*	0.5/6 *0,056/0,678*
05	0.062 *1,575*	0.268 *6,807*	1.270 *32,258*	14	0.087 *39*	7 180 *31,95*	2 770 *12,32*	1/15 *0,113/1,695*
06	0.093 *2,362*	0.319 *8,103*	1.235 *31,369*	8	0.136 *62*	8 550 *38,05*	3 570 *15,88*	1/15 *0,113/1,695*
07	0.093 *2,362*	0.383 *9,728*	1.402 *35,611*	10	0.188 *83*	12 000 *53,4*	4 800 *21,35*	1/15 *0,113/1,695*
08	0.093 *2,362*	0.445 *11,303*	1.589 *40,361*	9	0.278 *126*	19 500 *86,70*	7 680 *34,16*	1/15 *0,113/1,695*
10	0.125 *3,175*	0.541 *13,741*	1.683 *42,748*	12	0.424 *192*	21 900 *97,45*	9 180 *40,83*	1/15 *0,113/1,695*
12	0.125 *3,175*	0.663 *16,840*	1.808 *45,923*	13	0.639 *290*	29 300 *130,38*	11 600 *51,60*	1/15 *0,113/1,695*
14	0.156 *3,962*	0.777 *19,736*	2.121 *53,873*	6	0.963 *437*	34 500 *153,52*	13 100 *58,27*	1/24 *0,113/2,712*
16	1.187 *30,150*	1.136 *28,854*	2.464 *62,586*	12	2.546 *1 150*	80 300 *357,31*	30 400 *135,22*	1/24 *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]

Technical specification	AS 81935
Product standard	AS 81935/4
Bearing	NAS..R inch (440C inner ring) ENAS..R inch (PH13.8 inner ring)



Dimensions

Nominal bore code	**Dimensions** d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0.254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A ±0.031 *±0.79*	d_k ≈	r ±0.005 *±0,127*	H UNJF-3A	L ±0.010 *±0.254*
–	in/*mm*							–	in/*mm*
03	0.1900 *4,826*	0.680 *17,272*	0.281 *7,137*	0.228 *5,791*	0.775 *19,685*	0.406 *10,312*	0.010 *0,254*	1/4-28 *6,35-28*	1.315 *33,401*
03B	0.1900 *4,826*	0.680 *17,272*	0.281 *7,137*	0.228 *5,791*	0.775 *19,685*	0.406 *10,312*	0.010 *0,254*	1/4-28 *6,35-28*	1.315 *33,401*
04	0.2500 *6,350*	0.827 *21,006*	0.343 *8,712*	0.260 *6,604*	0.775 *19,685*	0.500 *12,704*	0.010 *0,254*	1/4-28 *6,35-28*	1.443 *36,652*
05	0.3125 *7,937*	0.984 *24,994*	0.375 *9,525*	0.291 *7,391*	1.187 *30,150*	0.562 *14,283*	0.010 *0,254*	5/16-24 *7,94-24*	1.948 *49,479*
06	0.3750 *9,525*	1.131 *28,727*	0.406 *10,312*	0.322 *8,179*	1.187 *30,150*	0.625 *15,872*	0.010 *0,254*	3/8-24 *9,52-24*	2.030 *51,562*
07	0.4375 *11,112*	1.294 *32,868*	0.437 *11,100*	0.353 *8,966*	1.281 *32,537*	0.687 *17,448*	0.010 *0,254*	7/16-20 *11,11-20*	2.250 *57,150*
08	0.5000 *12,700*	1.459 *37,059*	0.500 *12,700*	0.400 *10,160*	1.468 *37,287*	0.781 *19,838*	0.010 *0,254*	1/2-20 *12,7-20*	2.544 *64,618*
10	0.6250 *15,875*	1.763 *44,780*	0.625 *15,875*	0.510 *12,954*	1.562 *39,675*	0.978 *24,584*	0.010 *0,254*	5/8-18 *15,87-18*	2.832 *71,933*
12	0.7500 *19,050*	2.140 *54,356*	0.750 *19,050*	0.603 *15,316*	1.687 *42,850*	1.187 *30,149*	0.010 *0,254*	3/4-16 *19,05-16*	3.193 *81,102*
14	0.8750 *22,225*	2.372 *60,249*	0.875 *22,225*	0.713 *18,110*	2.000 *50,800*	1.314 *33,370*	0.010 *0,254*	7/8-14 *22,22-14*	3.677 *93,396*
16	1.0000 25,400	2.681 68,097	1.000 25,400	0.807 20,498	2.100 53,340	1.500 *38,099*	0.010 0,254	1-12 25,4-12	3.968 100,787

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[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
MJ/NAS14

S E MJ/NAS 04 G K

Rod end body material and surface treatment

No code	Cadmium plated 4340 steel
S[2]	Zinc-nickel plated 4340 steel

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

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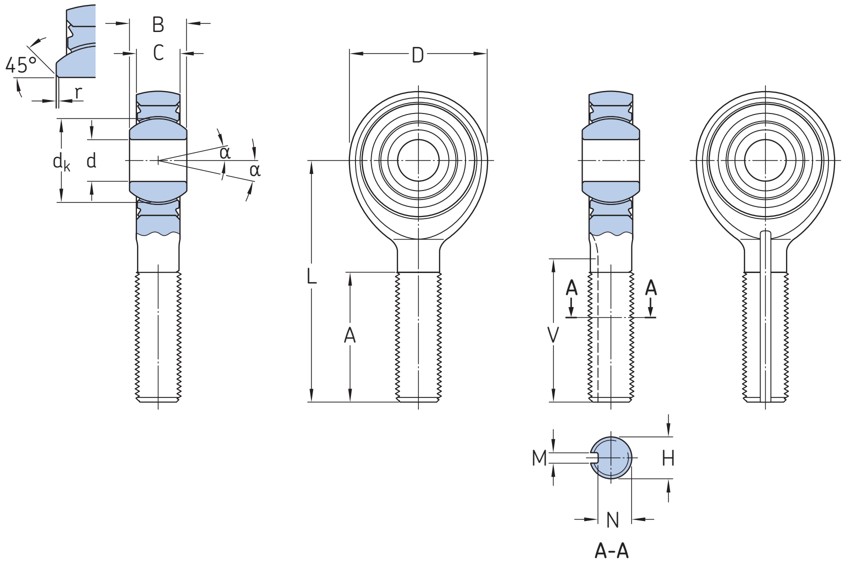
[2] SKF option

Dimensions cont., loads and torque

Nominal bore code	**Dimensions** M +0.005/0 *+0,127/0*	N 0/–0.005 *0/–0,127*	V Min	 max	α	**Mass** ≈	**Radial loads** Ultimate	 Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*				°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.062 *1,575*	0.207 *5,258*	0.876 *22,250*	0.896 *22,758*	10	0.038 *17*	3 000 *13,34*	1 100 *4,89*	0.5/6 *0,056/0,678*
03B	0.062 *1,575*	0.207 *5,258*	0.836 *21,234*	0.876 *22,250*	10	0.038 *17*	3 000 *13,34*	1 100 *4,89*	0.5/6 *0,056/0,678*
04	0.062 *1,575*	0.207 *2,258*	0.876 *22,250*	0.896 *22,758*	10	0.045 *20*	5 300 *23,6*	1 500 *6,67*	0.5/6 *0,056/0,678*
05	0.062 *1,575*	0.268 *6,807*	1.288 *32,715*	1.308 *33,223*	10	0.081 *37*	8 600 *38,25*	2 400 *10,67*	1/15 *0,113/1,695*
06	0.093 *2,362*	0.319 *8,103*	1.288 *32,715*	1.308 *33,223*	9	0.120 *54*	13 000 *57,82*	3 600 *16,01*	1/15 *0,113/1,695*
07	0.093 *2,362*	0.383 *9,728*	1.382 *35,103*	1.402 *35,611*	8	0.172 *78*	17 800 *79,17*	5 000 *22,24*	1/15 *0,113/1,695*
08	0.093 *2,362*	0.445 *11,303*	1.569 *39,853*	1.589 *40,361*	8	0.254 *115*	24 200 *107,64*	6 800 *30,25*	1/15 *0,113/1,695*
10	0.125 *3,175*	0.541 *13,741*	1.663 *42,240*	1.683 *42,748*	8	0.455 *206*	38 500 *171,25*	10 800 *48,04*	1/15 *0,113/1,695*
12	0.125 *3,175*	0.663 *16,840*	1.788 *45,415*	1.808 *45,923*	8	0.774 *351*	56 600 *251,76*	16 000 *71,17*	1/15 *0,113/1,695*
14	0.156 *3,962*	0.777 *19,736*	2.101 *53,365*	2.121 *53,873*	8	1.141 *518*	77 400 *344,27*	21 900 *97,41*	1/24 *0,113/2,712*
16	0.156 *3,962*	0.900 *22,860*	2.201 *55,905*	2.221 *56,413*	9	1.646 *747*	101 400 *451,03*	28 600 *127,21*	1/24 *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]



Technical specification	AS 81935
Product standard	AS 81935/8
Rod end material	PH13.8 passivated
Bearing	NAS..R inch (440C inner ring) ENAS..R inch (PH13.8 inner ring)

Dimensions

Nominal bore code	**Dimensions** d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0.254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A ±0.031 *±0.79*	d_k ≈	r ±0.005 *±0,127*	H UNJF-3A	L ±0.010 *±0.254*
–	in/*mm*							–	in/*mm*
03	0.1900 *4,826*	0.680 *17,272*	0.281 *7,137*	0.228 *5,791*	0.775 *19,685*	0.406 *10,312*	0.010 *0,254*	1/4-28 *6,35-28*	1.315 *33,401*
04	0.2500 *6,350*	0.827 *21,006*	0.343 *8,712*	0.260 *6,604*	0.775 *19,685*	0.500 *12,704*	0.010 *0,254*	1/4-28 *6,35-28*	1.443 *36,652*
05	0.3125 *7,937*	0.984 *24,994*	0.375 *9,525*	0.291 *7,391*	1.187 *30,150*	0.562 *14,283*	0.010 *0,254*	5/16-24 *7,94-24*	1.948 *49,479*
06	0.3750 *9,525*	1.131 *28,727*	0.406 *10,312*	0.322 *8,179*	1.187 *30,150*	0.625 *15,872*	0.010 *0,254*	3/8-24 *9,52-24*	2.030 *51,562*
07	0.4375 *11,112*	1.294 *32,868*	0.437 *11,100*	0.353 *8,966*	1.281 *32,537*	0.687 *17,448*	0.010 *0,254*	7/16-20 *11,11-20*	2.250 *57,150*
08	0.5000 *12,700*	1.459 *37,059*	0.500 *12,700*	0.400 *10,160*	1.468 *37,287*	0.781 *19,838*	0.010 *0,254*	1/2-20 *12,7-20*	2.544 *64,618*
10	0.6250 *15,875*	1.763 *44,780*	0.625 *15,875*	0.510 *12,954*	1.562 *39,675*	0.968 *24,584*	0.010 *0,254*	5/8-18 *15,87-18*	2.832 *71,933*
12	0.7500 *19,050*	2.140 *54,356*	0.750 *19,050*	0.603 *15,316*	1.687 *42,850*	1.187 *30,149*	0.010 *0,254*	3/4-16 *19,05-16*	3.193 *81,102*
14	0.8750 *22,225*	2.372 *60,249*	0.875 *22,225*	0.713 *18,110*	2.000 *50,800*	1.314 *33,370*	0.010 *0,254*	7/8-14 *22,22-14*	3.677 *93,396*
16	1.0000 *25,400*	2.681 *68,097*	1.000 *25,400*	0.807 *20,498*	2.100 *53,340*	1.500 *38,099*	0.010 *0,254*	1-12 *25,4-12*	3.968 *100,787*

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[1] Parts are delivered and marked with PHUMJ/XRE.. or 12CNM.. standard references

Cross-reference designation system to PHUMJ/XRE.. or 12CNM..

Examples: EPHMJ/NAS03GK
PHMJ/NAS14

E PHMJ/NAS 04 G K

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

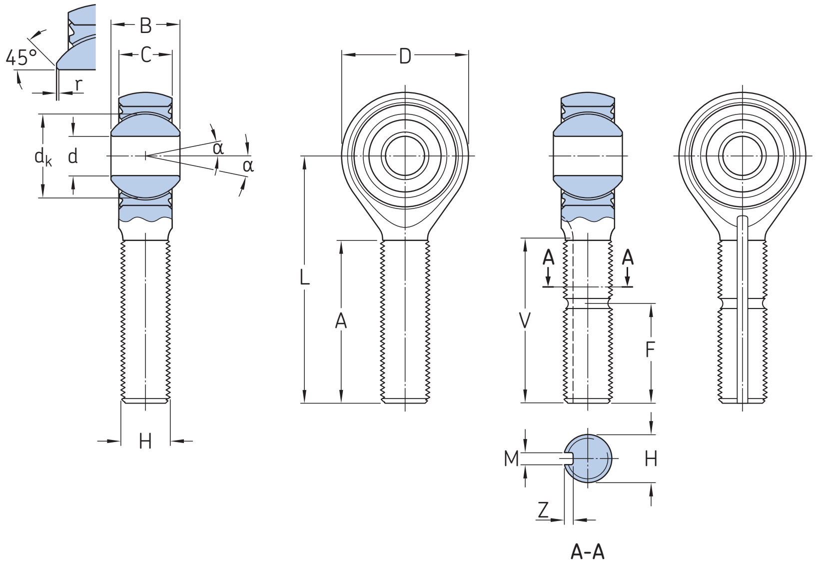
Keyway
No code Without keyway
K With keyway

Dimensions cont., loads and torque

Nominal bore code	Dimensions M +0.005/0 *+0,127/0*	N 0/–0.005 *0/–0,127*	V Min	max	α	Mass ≈	Radial loads Ultimate	Fatigue 50 000 cycles	Starting torque
–	in/*mm*				°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.062 *1,575*	0.207 *5,258*	0.836 *21,234*	0.896 *22,758*	10	0.038 *17*	3 000 *13,34*	1 100 *4,89*	0.5/6 *0,056/0,678*
04	0.062 *1,575*	0.207 *2,258*	0.876 *22,250*	0.896 *22,758*	10	0.045 *20*	5 300 *23,6*	1 500 *6,67*	0.5/6 *0,056/0,678*
05	0.062 *1,575*	0.268 *6,807*	1.288 *32,715*	1.308 *33,223*	10	0.081 *37*	8 600 *38,25*	2 400 *10,67*	1/15 *0,113/1,695*
06	0.093 *2,362*	0.319 *8,103*	1.288 *32,715*	1.308 *33,223*	9	0.120 *54*	13 000 *57,82*	3 600 *16,01*	1/15 *0,113/1,695*
07	0.093 *2,362*	0.383 *9,728*	1.382 *35,103*	1.402 *35,611*	8	0.172 *78*	17 800 *79,17*	5 000 *22,24*	1/15 *0,113/1,695*
08	0.093 *2,362*	0.445 *11,303*	1.569 *39,853*	1.589 *40,361*	8	0.254 *115*	24 200 *107,64*	6 800 *30,25*	1/15 *0,113/1,695*
10	0.125 *3,175*	0.541 *13,741*	1.663 *42,240*	1.683 *42,748*	8	0.455 *206*	38 500 *171,25*	10 800 *48,04*	1/15 *0,113/1,695*
12	0.125 *3,175*	0.663 *16,840*	1.788 *45,415*	1.808 *45,923*	8	0.774 *351*	56 600 *251,76*	16 000 *71,17*	1/15 *0,113/1,695*
14	0.156 *3,962*	0.777 *19,736*	2.101 *53,365*	2.121 *53,873*	8	1.141 *518*	77 400 *344,27*	21 900 *97,41*	1/24 *0,113/2,712*
16	0.156 *3,962*	0.900 *22,860*	2.201 *55,905*	2.221 *56,413*	9	1.646 *747*	101 400 *451,03*	28 600 *127,21*	1/24 *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	**Dimensions** d 0/–0.0005 *0/–0,0127*	B 0/–0.002 *0/–0,051*	D ±0.010 *±0,254*	C ±0.005 *±0,127*	L ±0.010 *±0,254*	r +0.010/0 *+0,254/0*	H UNJF-3A	A +0.060/–0.030 *+1,524/–0,762*	d_k ≈
–	in/*mm*						–	in/*mm*	
03	0.1900 *4,826*	0.437 *11,100*	0.806 *20,472*	0.337 *8,560*	1.562 *39,675*	0.005 *0,127*	5/16-24	1.000 *25,400*	0.531 *13,487*
04	0.2500 *6,350*	0.437 *11,100*	0.806 *20,472*	0.337 *8,560*	1.562 *39,675*	0.005 *0,127*	5/16-24	1.000 *25,400*	0.531 *13,487*
05	0.3125 *7,937*	0.437 *11,100*	0.900 *22,860*	0.327 *8,306*	1.875 *47,625*	0.005 *0,127*	5/16-24	1.062 *26,974*	0.593 *15,062*
051	0.3125 *7,937*	0.437 *11,100*	0.900 *22,860*	0.327 *8,306*	2.270 *57,655*	0.005 *0,127*	5/16-24	1.457 *37,000*	0.593 *15,062*
06	0.3750 *9,525*	0.500 *12,700*	1.025 *26,035*	0.416 *10,566*	1.938 *49,225*	0.005 *0,127*	3/16-24	1.250 *31,750*	0.687 *17,449*
061	0.3750 *9,525*	0.500 *12,700*	1.025 *26,035*	0.416 *10,566*	2.341 *59,475*	0.005 *0,127*	3/16-24	1.653 *42,000*	0.687 *17,449*
07	0.4375 *11,112*	0.562 *14,274*	1.150 *29,210*	0.452 *11,481*	2.125 *53,975*	0.005 *0,127*	7/16-20	1.375 *34,925*	0.781 *19,837*
08	0.5000 *12,700*	0.625 *15,875*	1.337 *33,960*	0.515 *13,081*	2.438 *61,925*	0.005 *0,127*	1/2-20	1.500 *38,100*	0.875 *22,225*
081	0.5000 *12,700*	0.625 *15,875*	1.337 *33,960*	0.515 *13,081*	3.044 *77,325*	0.005 *0,127*	1/2-20	2.126 *54,000*	0.875 *22,225*
10	0.6250 *15,875*	0.750 *19,050*	1.525 *38,735*	0.577 *14,656*	2.625 *66,675*	0.005 *0,127*	5/8-20	1.625 *41,275*	1.062 *26,974*
12	0.7500 *19,050*	0.875 *22,225*	1.775 *45,085*	0.640 *16,256*	2.875 *73,025*	0.005 *0,127*	3/4-16	1.750 *44,450*	1.250 *31,750*
14	0.8750 *22,225*	0.875 *22,225*	2.025 *51,435*	0.765 *19,431*	3.375 *85,725*	0.005 *0,127*	7/8-14	1.875 *47,625*	1.375 *34,925*
16	1.0000 *25,400*	1.375 *34,925*	2.775 *70,485*	1.015 *25,781*	4.125 *104,775*	0.005 *0,127*	1 1/4-12	2.123 *53,915*	1.937 *49,200*

Designation system

Examples: R03MLCK
R12MR

R 03 M L C K

Basic designation – R

Bore code (multiples of 1/16 inch) – 03

Thread direction – L

R	Right-hand thread
L	Left-hand thread

Surface treatment of rod end body – C

No code	No treatment
C[1]	C = Cadmium plated
J[1]	J = zinc-nickel plated

Keyway – K

No code	Without keyway
K	With keyway

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[1] SKF option

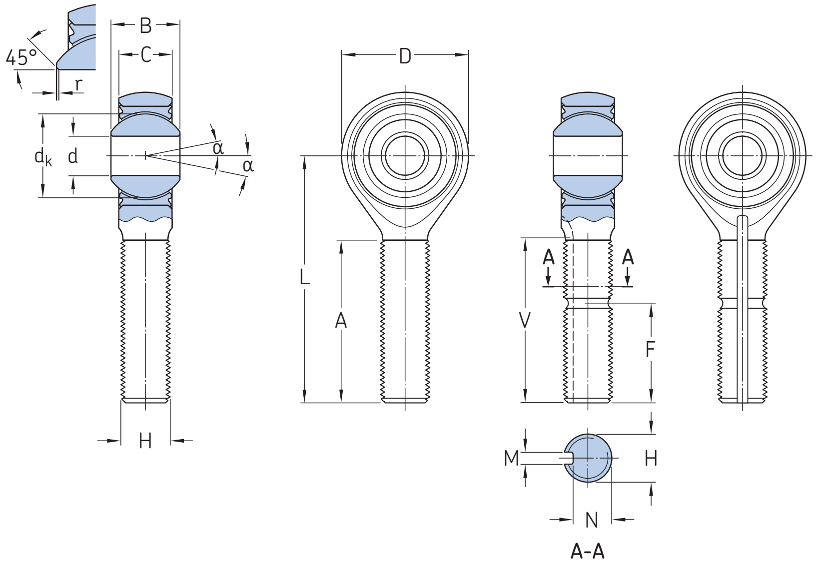
Dimensions cont., loads and torque

Nominal bore code	**Dimensions** Z +0.005/0 *+0,127/0*	 M +0.005/0 *+0,127/0*	 V +0.010/–0.030 *+0,254/–0,762*	 α	**Mass** ≈	**Radial loads** Ultimate	 Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*			°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.052 *1,320*	0.062 *1,575*	0.920 *23,368*	17	0.06 *27,21*	4 800 *21,35*	1470.25 *6,54*	0.5/6 *0,056/0,678*
04	0.052 *1,320*	0.062 *1,575*	0.920 *23,368*	17	0.06 *27,21*	4 800 *21,35*	2380.73 *10,59*	0.5/6 *0,056/0,678*
05	0.052 *1,320*	0.062 *1,575*	0.980 *24,892*	14	0.07 *31,75*	5 500 *24,47*	2769.65 *12,32*	*1/10* *0,113/1,129*
051	0.052 *1,320*	0.062 *1,575*	0.980 *24,892*	14	0.07 *31,75*	5 500 *24,47*	2769.65 *12,32*	*1/10* *0,113/1,129*
06	0.064 *1,625*	0.093 *2,362*	1.170 *29,718*	10	0.11 *49,89*	7 000 *31,14*	3569.97 *15,88*	*1/10* *0,113/1,129*
061	0.064 *1,625*	0.093 *2,362*	1.170 *29,718*	10	0.11 *49,89*	7 000 *31,14*	3569.97 *15,88*	*1/10* *0,113/1,129*
07	0.067 *1,701*	0.093 *2,362*	1.275 *32,385*	12	0.15 *68,03*	8 100 *36,03*	4799.67 *21,35*	*1/10* *0,113/1,129*
08	0.064 *1,625*	0.093 *2,362*	1.400 *35,560*	9	0.25 *113,39*	14 200 *63,16*	7679.48 *34,16*	*1/10* *0,113/1,129*
081	0.064 *1,625*	0.093 *2,362*	1.400 *35,560*	9	0.25 *113,39*	14 200 *63,16*	7679.48 *34,16*	*1/10* *0,113/1,129*
10	0.084 *2,133*	0.125 *3,175*	1.515 *38,481*	12	0.37 *167,82*	16 150 *71,84*	9178.95 *40,83*	*1/10* *0,113/1,129*
12	0.087 *2,209*	0.125 *3,175*	1.625 *41,275*	14	0.58 *263,08*	21 000 *93,41*	11 600,14 *51,60*	*1/10* *0,113/1,129*
14	0.098 *2,489*	0.156 *3,962*	1.730 *43,942*	7	0.79 *358,33*	26 000 *115,65*	13099.62 *58,27*	2/16 *0,226/1,807*
16	0.114 *2,895*	0.187 *4,750*	1.960 *49,784*	15	2.30 *1 043,26*	55 500 *246,88*	30400.92 *135,23*	2/16 *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 for the bearing
Product standard	–
Bearing	WAS..R inch



Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A +0.06/–0.03 *+1,524/–0,762*	V 0/–0.020 *0/–0,508*	d$_k$ ≈	r ±0.005 *±0,127*	H UNJF-3A
–		in/*mm*								–
4,83	**03**	0.1900 *4,826*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	1.000 *25,400*	1.000 *25,400*	0.530 *13,464*	0.010 *0,254*	5/16-24 *7,94-24*
6,35	**04**	0.2500 *6,350*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	1.000 *25,400*	1.000 *25,400*	0.530 *13,464*	0.010 *0,254*	5/16-24 *7,94-24*
7,94	**05**	0.3125 *7,937*	0.900 *22,860*	0.437 *11,100*	0.327 *8,306*	1.062 *26,975*	1.062 *26,975*	0.566 *14,381*	0.010 *0,254*	5/16-24 *7,94-24*
9,52	**06**	0.3750 *9,525*	1.025 *26,035*	0.500 *12,700*	0.416 *10,566*	1.250 *31,750*	1.250 *31,750*	0.683 *17,361*	0.010 *0,254*	3/8-24 *9,52-24*
11,11	**07**	0.4375 *11,112*	1.150 *29,210*	0.562 *14,275*	0.452 *11,481*	1.375 *34,925*	1.375 *34,925*	0.777 *19,744*	0.010 *0,254*	7/16-20 *11,11-20*
12,7	**08**	0.5000 *12,700*	1.337 *33,960*	0.625 *15,875*	0.515 *13,081*	1.500 *38,100*	1.500 *38,100*	0.871 *22,130*	0.010 *0,254*	1/2-20 *12,7-20*
15,87	**10**	0.6250 *15,875*	1.525 *38,735*	0.750 *19,050*	0.577 *14,656*	1.625 *41,275*	1.625 *41,275*	1.059 *26,887*	0.010 *0,254*	5/8-18 *15,87-18*
19,05	**12**	0.7500 *19,050*	1.775 *45,085*	0.875 *22,225*	0.640 *16,256*	1.750 *44,450*	1.750 *44,450*	1.216 *30,897*	0.010 *0,254*	3/4-16 *19,05-16*
22,22	**14**	0.8750 *22,225*	2.025 *51,435*	0.875 *22,225*	0.765 *19,431*	1.875 *47,625*	1.875 *47,625*	1.325 *33,655*	0.010 *0,254*	7/8-14 *22,22-14*
25,4	**16**	1.0000 *25,400*	2.775 *70,485*	1.375 *34,925*	1.015 *25,781*	2.125 *53,975*	2.125 *53,975*	1.871 *47,526*	0.010 *0,254*	1.1/4-12 *31,75-12*

Designation system

Examples: XEMJ/RL6,35RGZKX
EMJ/RL22,22

X | EMJ/RL | 6,35 | R | G | Z | K | X

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[1]	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

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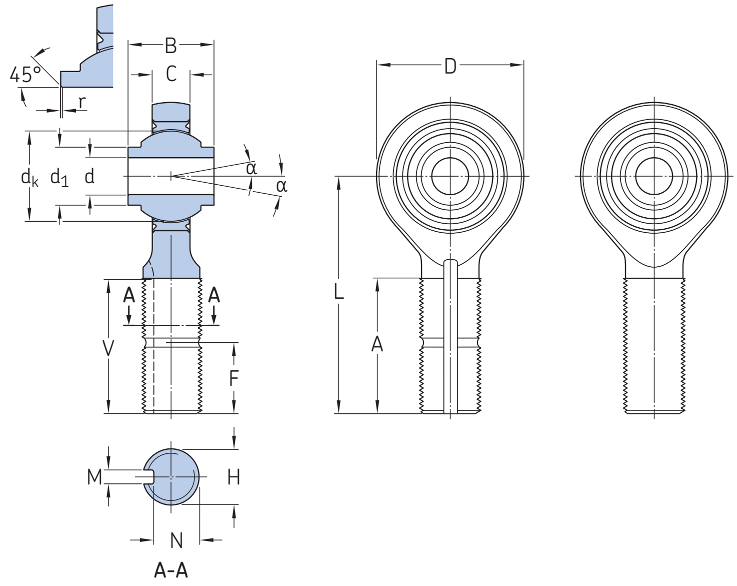
[1] SKF option, masses and load carrying capability reduced compared to steel rod end body

Dimensions cont., loads and torque

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** L ±0.010 *±0,254*	M +0.005/0 *+0,127/0*	N 0/–0.005 *0/–0,127*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 10^6 cycles	**Starting torque** Standard	Reduced
–		in/*mm*			°	lb/*g*	lbf/*kN*		lbf-in/*Nm*	
4,83	**03**	1.562 *39,675*	0.062 *1,575*	0.260 *6,604*	16	0.07 *30*	6 195 *27,56*	1 052 *4,68*	0.53/10 *0,06/1,12*	1.1 max 0,12 max
6,35	**04**	1.562 *39,675*	0.062 *1,575*	0.260 *6,604*	16	0.07 *30*	6 195 *27,56*	1 052 *4,68*	0.53/10 *0,06/1,12*	1.1 max *0,12 max*
7,94	**05**	1.875 *47,625*	0.062 *1,575*	0.260 *6,604*	15	0.08 *35*	7 585 *33,74*	1 090 *4,85*	1/10 *0,11/1,12*	2 max *0,22 max*
9,52	**06**	1.938 *49,225*	0.093 *2,362*	0.311 *7,900*	9	0.12 *55*	8 940 *39,78*	1 513 *6,73*	1/10 *0,11/1,12*	2 max *0,22 max*
11,11	**07**	2.125 *53,975*	0.093 *2,362*	0.370 *9,400*	11	0.17 *75*	9 595 *42,68*	1 920 *8,54*	1/10 *0,11/1,12*	2 max *0,22 max*
12,7	**08**	2.438 *61,925*	0.093 *2,362*	0.436 *11,074*	9	0.28 *127*	18 750 *83,42*	3 069 *13,65*	1/10 *0,11/1,12*	2 max *0,22 max*
15,87	**10**	2.625 *66,675*	0.125 *3,175*	0.541 *13,741*	12	0.38 *172*	20 680 *91,99*	3 480 *15,48*	1/10 *0,11/1,12*	2 max *0,22 max*
19,05	**12**	2.875 *73,025*	0.125 *3,175*	0.663 *16,840*	13	0.58 *263*	27 795 *123,65*	4 586 *20,40*	1/10 *0,11/1,12*	2 max *0,22 max*
22,22	**14**	3.375 *85,725*	0.156 *3,962*	0.777 *19,735*	6	0.81 *370*	31 725 *141,13*	5 348 *23,79*	2/15.9 *0,23/1,8*	4.1 max *0,46 max*
25,4	**16**	4.125 *104,775*	0.187 *4,750*	1.136 *28,854*	12	2.40 *1 100*	71 745 *319,16*	11 990 *53,33*	2/15.9 *0,23/1,8*	4.1 max *0,46 max*

3.28 External thread inserted self-lubricating spherical plain bearing rod end (inch dimensions)

EMJ/RT..R



Technical specification	AS 81820 for the bearing
Product standard	–
Bearing	XRT..R inch

Dimensions

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions**									
		d 0/–0.0005 *0/–0,0127*	D +0.035/–0.010 *+0,889/–0,254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A +0.06/–0.03 *+1,524/–0,762*	V 0/–0.020 *0/–0,508*	d_k ≈	d_1 ≈	r +0.012/0 *+0,3/0*	H UNJF-3A
–		in/*mm*									–
4,83	**03**	0.1900 *4,826*	0.750 *19,050*	0.500 *12,700*	0.220 *5,588*	1.000 *25,400*	1.000 *25,400*	0.437 *11,100*	0.315 *8,001*	0.004 *0,100*	5/16-24 *7,94-24*
6,35	**04**	0.2500 *6,350*	1.000 *25,400*	0.593 *15,062*	0.265 *6,731*	1.250 *31,750*	1.250 *31,750*	0.594 *15,080*	0.386 *9,804*	0.004 *0,100*	3/8-24 *9,52-24*
7,94	**05**	0.3125 *7,937*	1.125 *28,575*	0.813 *20,650*	0.355 *9,017*	1.375 *34,925*	1.375 *34,925*	0.781 *19,838*	0.512 *13,005*	0.004 *0,100*	7/16-20 *11,11-20*
9,52	**06**	0.3750 *9,525*	1.125 *28,575*	0.813 *20,650*	0.355 *9,017*	1.375 *34,925*	1.375 *34,925*	0.781 *19,838*	0.532 *13,513*	0.004 *0,100*	7/16-20 *11,11-20*
11,11	**07**	0.4375 *11,112*	1.312 *33,325*	0.875 *22,225*	0.355 *9,017*	1.500 *38,100*	1.500 *38,100*	0.866 *22,000*	0.620 *15,748*	0.004 *0,100*	1/2-20 *12,7-20*
12,7	**08**	0.5000 *12,700*	1.500 *38,100*	0.937 *23,799*	0.411 *10,439*	1.625 *41,275*	1.625 *41,275*	0.984 *25,000*	0.728 *18,491*	0.004 *0,100*	5/8-18 *15,87-18*
15,87	**10**	0.6250 *15,875*	1.750 *44,450*	1.200 *30,480*	0.577 *14,656*	1.750 *44,45*	1.750 *44,45*	1.240 *31,500*	0.857 *21,768*	0.004 *0,100*	3/4-16 *19,05-16*
19,05	**12**	0.7500 *19,050*	2.000 *50,800*	1.280 *32,512*	0.630 *16,002*	1.875 *47,625*	1.875 *47,625*	1.339 *34,000*	0.963 *24,460*	0.004 *0,100*	7/8-14 *22,22-14*
22,22	**14**	0.8750 *22,225*	2.200 *55,880*	1.400 *35,560*	0.635 *16,129*	2.000 *50,800*	2.000 *50,800*	1.531 *38,900*	1.122 *28,500*	0.004 *0,100*	7/8-14 *22,22-14*
25,4	**16**	1.0000 *25,400*	2.750 *69,850*	1.875 *47,625*	0.845 *21,463*	2.125 *53,975*	2.125 *53,975*	1.875 *47,625*	1.272 *32,309*	0.004 *0,100*	1 1/4-12 *31,75-12*

Designation system

Examples: XEMJ/RT6,35RGZKX
EMJ/RT11,11R

X EMJ/RT 6,35 R G Z K X

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[1]	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

---

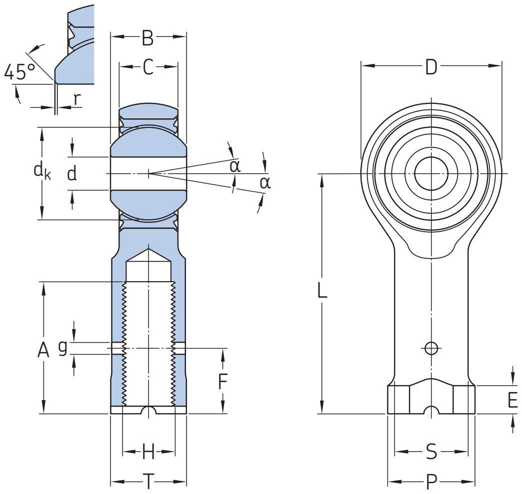
1) SKF option, masses and load carrying capability reduced compared to steel rod end body

Dimensions cont., loads and torque

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** L ±0.010 *±0,254*	M +0.005/0 *+0,127/0*	N 0/–0.005 *0/–0,127*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 10^6 cycles	**Starting torque** Standard	Reduced
–		in/*mm*			°	lb/*g*	lbf/*kN*		lbf-in/*Nm*	
4,83	**03**	1.500 *38,100*	0.062 *1,575*	0.260 *6,604*	15	0.06 *27*	4 800 *21,35*	762 *3,39*	0.53/5 *0,06/0,56*	1 max *0,12 max*
6,35	**04**	1.938 *49,225*	0.093 *2,362*	0.311 *7,899*	24	0.11 *50*	8 185 *36,40*	1 311 *5,83*	0.53/5 *0,06/0,56*	1 max *0,12 max*
7,94	**05**	2.125 *53,975*	0.093 *2,362*	0.370 *9,400*	23	0.16 *73*	8 620 *38,34*	1 414 *6,29*	0.7/7 *0,08/0,8*	2 max *0,22 max*
9,52	**06**	2.125 *53,975*	0.093 *2,362*	0.370 *9,400*	22	0.16 *73*	8 620 *38,34*	1 414 *6,29*	0.88/9 *0,10/1,02*	2 max *0,22 max*
11,11	**07**	2.438 *61,925*	0.093 *2,362*	0.436 *11,074*	22	0.25 *114*	13 025 *57,93*	2 104 *9,36*	0.88/9 *0,10/1,02*	2 max *0,22 max*
12,7	**08**	2.625 *66,675*	0.125 *3,175*	0.541 *13,741*	20	0.41 *186*	18 165 *80,80*	2 947 *13,11*	0.88/9 *0,10/1,02*	2 max *0,22 max*
15,87	**10**	2.875 *73,025*	0.125 *3,175*	0.663 *16,840*	20	0.64 *290*	24 010 *106,80*	3 973 *17,67*	1/12,4 *0,11/1,4*	2 max *0,22 max*
19,05	**12**	3.375 *85,725*	0.156 *3,962*	0.777 *19,735*	19	0.92 *417*	26 990 *120,05*	5 052 *22,47*	1/12,4 *0,11/1,4*	2 max *0,22 max*
22,22	**14**	3.750 *95,250*	0.156 *3,962*	0.777 *19,735*	19	1.11 *508*	28 880 *128,46*	5 295 *23,55*	2.21/18 *0,25/2,04*	4 max *0,46 max*
25,4	**16**	4.125 *104,775*	0.187 *4,750*	1.136 *28,854*	21	2.14 *970*	60 230 *267,90*	9 858 *43,85*	2.21/18 *0,25/2,04*	4 max *0,46 max*

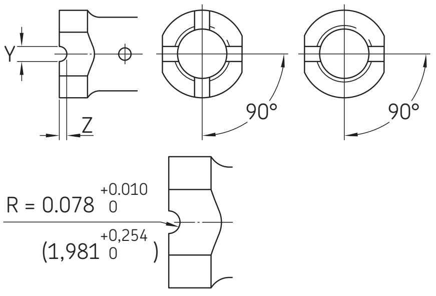
3.29 Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

FJ/WAS.. (UFJ/XRL.. or 12BF..)[1] bore code **03** to **07**

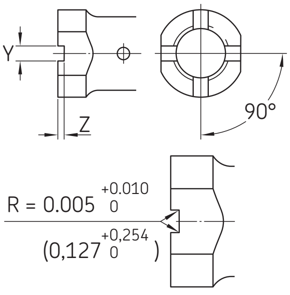


Technical specification	AS 81935
Product standard	AS 81935/2
Bearing	WAS..R inch (440C inner ring) EWAS..R inch (PH13.8 inner ring)

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



Rounded keyway



Square keyway

Dimensions

Nominal bore code	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A Min	d_k ≈	r ±0.005 *±0,127*	H UNJF-3B
–	in/*mm*							–
03	0.1900 *4,826*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.750 *19,050*	0.530 *13,464*	0.010 *0,254*	5/16-24 *7,94-24*
04	0.2500 *6,350*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.750 *19,050*	0.530 *13,464*	0.010 *0,254*	5/16-24 *7,94-24*
05	0.3125 *7,937*	0.900 *22,860*	0.437 *11,100*	0.327 *8,306*	0.875 *22,225*	0.566 *14,381*	0.010 *0,254*	3/8-24 *9,52-24*
06	0.3750 *9,525*	1.025 *26,035*	0.500 *12,700*	0.416 *10,566*	1.000 *25,400*	0.683 *17,361*	0.010 *0,254*	3/8-24 *9,52-24*
07	0.4375 *11,112*	1.150 *29,210*	0.562 *14,275*	0.452 *11,481*	1.125 *28,575*	0.777 *19,744*	0.010 *0,254*	7/16-20 *11,11-20*

Dimensions cont.

Nominal bore code	Dimensions g ≈	L ±0.010 *±0,254*	P ≈	F ±0.020 *±0,508*	S ±0.010 *±0,254*	T +0.002/–0.010 *+0,051/–0,254*	E +0.010/–0.062 *+0,254/–1,576*	Z[2] +0.005/0 *+0,127/0*	Y[2] +0.005/0 *+0,127/0*
–	in/*mm*								
03	0.07 *1,778*	1.375 *34,925*	0.500 *12,700*	0.375 *9,512*	0.422 *10,719*	0.437 *11,100*	0.188 *4,775*	– –	– –
04	0.07 *1,778*	1.469 *37,313*	0.500 *12,700*	0.375 *9,512*	0.422 *10,719*	0.437 *11,100*	0.188 *4,775*	– –	– –
05	0.07 *1,778*	1.625 *41,275*	0.580 *14,732*	0.437 *11,100*	0.485 *12,319*	0.500 *12,700*	0.250 *6,350*	– –	– –
06	0.07 *1,778*	1.812 *46,025*	0.660 *16,764*	0.437 *11,100*	0.547 *13,894*	0.562 *14,275*	0.250 *6,350*	– –	– –
07	0.07 *1,778*	2.000 *50,800*	0.720 *18,288*	0.500 *12,687*	0.610 *15,494*	0.625 *15,875*	0.250 *6,350*	– –	– –

---

[1] Parts are delivered and marked with UFJ/XRL.. and 12BF.. standard references

[2] K version

Cross-reference designation system to UFJ/XRL.. or 12BF..

Examples: SEFJ/WAS04GK
FJ/WAS14

S E FJ/WAS 04 G K

Rod end body material and surface treatment

No code	Cadmium plated 4340 steel
S[3]	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 type K
W	With deep keyway type W

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[3] SKF option

Dimensions cont., loads and torque

Nominal bore code	**Dimensions** Z[4] +0.005/0 *+0,127/0*	 Y[4] +0.005/0 *+0,127/0*	 α	**Mass** ≈	**Radial loads** Ultimate	 Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*		°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.110 *2,794*	0.062 *1,575*	15	0.080 *36*	2 360 *10,50*	1 470 *6,54*	0.5/6 *0,056/0,678*
04	0.110 *2,794*	0.062 *1,575*	15	0.084 *38*	4 860 *21,62*	2 380 *10,59*	0.5/6 *0,056/0,678*
05	0.110 *2,794*	0.093 *2,362*	14	0.102 *46*	7 180 *31,95*	3 020 *13,43*	1/15 *0,113/1,695*
06	0.110 *2,794*	0.093 *2,362*	8	0.161 *73*	8 550 *38,05*	3 570 *15,88*	1/15 *0,113/1,695*
07	0.110 *2,794*	0.093 *2,362*	10	0.212 *96*	12 000 *53,40*	4 800 *21,35*	1/15 *0,113/1,695*

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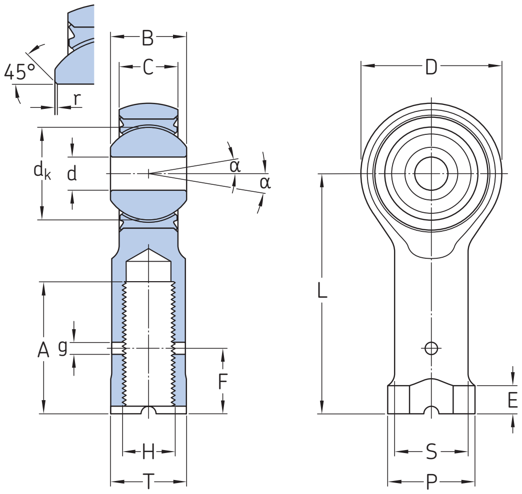
[4] W version

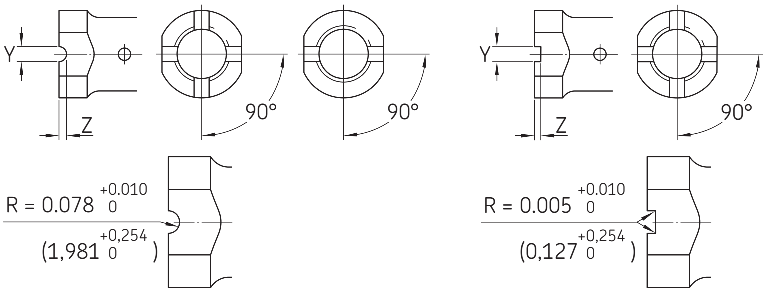
3.29 Internal inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

FJ/WAS.. (UFJ/XRL.. or 12BF..)1) bore code **08** to **16**



Technical specification	AS 81935
Product standard	AS 81935/2
Bearing	WAS..R inch (440C inner ring) 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



Rounded keyway

Square keyway

Dimensions

Nominal bore code	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A Min	d$_k$ ≈	r ±0.005 *±0,127*	H UNJF-3B
–	in/*mm*							–
08	0.5000	1.337	0.625	0.515	1.250	0.871	0.010	1/2-20
	12,700	*33,960*	*15,875*	*13,081*	*31,750*	*22,130*	*0,254*	*12,7-20*
10	0.6250	1.525	0.750	0.577	1.375	1.059	0.254	5/8-18
	15,875	*38,735*	*19,050*	*14,656*	*34,925*	*26,887*	*0,010*	*15,87-18*
12	0.7500	1.775	0.875	0.640	1.625	1.216	0.010	3/4-16
	19,050	*45,085*	*22,225*	*16,256*	*41,275*	*30,897*	*0,254*	*19,05-16*
14	0.8750	2.025	0.875	0.765	1.875	1.325	0.010	7/8-14
	22,225	*51,435*	*22,225*	*19,431*	*47,625*	*33,655*	*0,254*	*22,22-14*
16	1.0000	2.775	1.375	1.015	2.125	1.871	0.010	1 1/4-12
	25,400	*70,485*	*34,925*	*25,781*	*53,975*	*47,526*	*0,254*	*31,75-12*

Dimensions cont.

Nominal bore code	Dimensions g ≈	L ±0.010 *±0,254*	P ≈	F ±0.020 *±0,508*	S ±0.010 *±0,254*	T +0.002/–0.010 *+0,051/–0,254*	E +0.010/–0.062 *+0,254/–1,576*	Z2) +0.005/0 *+0,127/0*	Y2) +0.005/0 *+0,127/0*
–	in/*mm*								
08	0.07	2.250	0.880	0.562	0.735	0.750	0.250	–	–
	1,778	*57,150*	*22,352*	*14,275*	*18,669*	*19,050*	*6,350*	–	–
10	0.07	2.500	1.020	0.687	0.860	0.875	0.375	0.077	0.125
	1,778	*63,500*	*25,908*	*17,450*	*21,844*	*22,225*	*9,525*	1,956	3,175
12	0.07	2.875	1.160	0.812	0.985	1.000	0.375	0.077	0.125
	1,778	*73,025*	*29,464*	*20,625*	*25,019*	*25,400*	*9,525*	1,956	3,175
14	0.07	3.375	1.300	0.937	1.110	1.125	0.500	0.086	0.156
	1,778	*85,725*	*33,020*	*23,800*	*28,194*	*28,575*	*12,700*	2,184	3,962
16	0.07	4.125	2.020	1.312	1.688	1.750	0.563	0.116	0.187
	1,778	*104,775*	*51,308*	*33,325*	*42,875*	*44,450*	*14,300*	2,946	4,750

---

1) Parts are delivered and marked with UFJ/XRL.. and 12BF.. standard references

2) K version

Cross-reference designation system to UFJ/XRL.. or 12BF..

Examples: SEFJ/WAS04GK
FJ/WAS14

S E FJ/WAS 04 G K

Rod end body material and surface treatment

No code	Cadmium plated 4340 steel
S3)	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 type K
W	With deep keyway type W

---

3) SKF option

Dimensions cont., loads and torque

Nominal bore code	**Dimensions** Z4) +0.005/0 *+0,127/0*	Y4) +0.005/0 *+0,127/0*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*		°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
08	0.110 *2,794*	0.093 *2,362*	9	0.325 *147*	19 500 *86,70*	8 260 *36,74*	*1/15* 0.113/1.695
10	0.110 *2,794*	0.125 *3,175*	12	0.481 *218*	21 900 *97,45*	9 180 *40,83*	*1/15* 0.113/1.695
12	0.110 *2,794*	0.125 *3,175*	13	0.673 *305*	29 300 *130,38*	11 600 *51,60*	*1/15* 0.113/1.695
14	0.110 *2,794*	0.156 *3,962*	6	0.959 *435*	34 500 *153,52*	13 100 *58,27*	*1/24* 0.113/2.712
16	0.116 *2,946*	0.187 *4,750*	12	2.717 *1 232*	80 300 *357,31*	30 400 *135,22*	*1/24* 0.113/2.712

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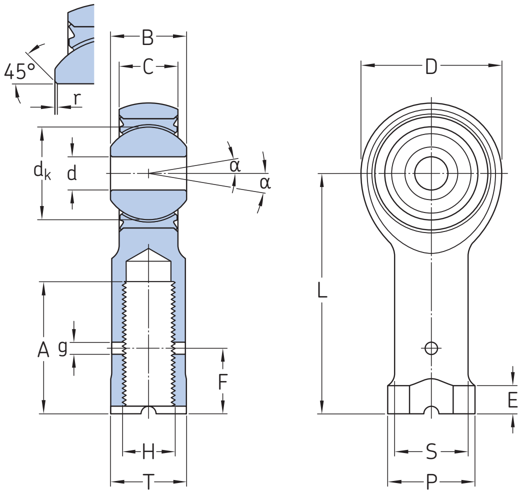
4) W version

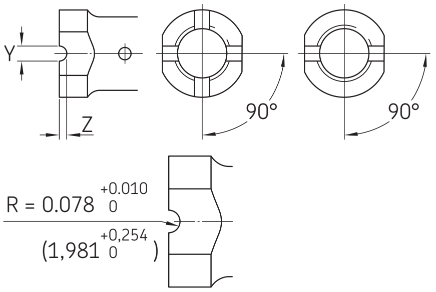
3.30 Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

PHFJ/WAS.. (PHUFJ/XRL.. or 12CF..)[1] bore code **03** to **07**

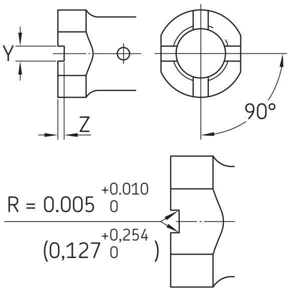
Technical specification	AS 81935
Product standard	AS 81935/7
Rod end body	PH13.8 passivated
Bearing	WAS..R inch (440C inner ring) EWAS..R inch (PH13.8 inner ring)



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



Rounded keyway



Square keyway

Dimensions

Nominal bore code	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A Min	d_k ≈	r ±0.005 *±0,127*	H UNJF-3B
–	in/*mm*							–
03	0.1900 *4,826*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.750 *19,050*	0.530 *13,464*	0.010 *0,254*	5/16-24 *7,94-24*
04	0.2500 *6,350*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.750 *19,050*	0.530 *13,464*	0.010 *0,254*	5/16-24 *7,94-24*
05	0.3125 *7,937*	0.900 *22,860*	0.437 *11,100*	0.327 *8,306*	0.875 *22,225*	0.566 *14,381*	0.010 *0,254*	3/8-24 *9,52-24*
06	0.3750 *9,525*	1.025 *26,035*	0.500 *12,700*	0.416 *10,566*	1.000 *25,400*	0.683 *17,361*	0.010 *0,254*	3/8-24 *9,52-24*
07	0.4375 *11,112*	1.150 *29,210*	0.562 *14,275*	0.452 *11,481*	1.125 *28,575*	0.777 *19,744*	0.010 *0,254*	7/16-20 *11,11-20*

Dimensions cont.

Nominal bore code	Dimensions g ≈	L ±0.010 *±0,254*	P ≈	F ±0.020 *±0,508*	S ±0.010 *±0,254*	T +0.002/–0.010 *+0,051/–0,254*	E +0.010/–0.062 *+0,254/–1,576*	Z[2] +0.005/0 *+0,127/0*	Y[2] +0.005/0 *+0,127/0*
–	in/*mm*								
03	0.07 *1,778*	1.375 *34,925*	0.500 *12,700*	0.375 *9,512*	0.422 *10,719*	0.437 *11,100*	0.188 *4,775*	– –	– –
04	0.07 *1,778*	1.469 *37,313*	0.500 *12,700*	0.375 *9,512*	0.422 *10,719*	0.437 *11,100*	0.188 *4,775*	– –	– –
05	0.07 *1,778*	1.625 *41,275*	0.580 *14,732*	0.437 *11,100*	0.485 *12,319*	0.500 *12,700*	0.250 *6,350*	– –	– –
06	0.07 *1,778*	1.812 *46,025*	0.660 *16,764*	0.437 *11,100*	0.547 *13,894*	0.562 *14,275*	0.250 *6,350*	– –	– –
07	0.07 *1,778*	2.000 *50,800*	0.720 *18,288*	0.500 *12,687*	0.610 *15,494*	0.625 *15,875*	0.250 *6,350*	– –	– –

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[1] Parts are delivered and marked with PHUFJ/XRL.. or 12CF.. standard references

[2] K version

Cross-reference designation system to PHUFJ/XRL.. or 12CF..

Examples: EPHFJ/WAS04GK
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

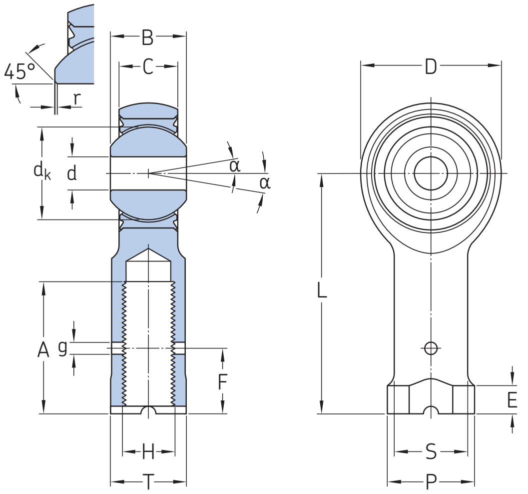
Dimensions cont., loads and torque

Nominal bore code	**Dimensions** Z2) +0.005/0 *+0,127/0*	Y2) +0.005/0 *+0,127/0*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*		°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.110 *2,794*	0.062 *1,575*	15	0.080 *36*	2 360 *10,50*	1 470 *6,54*	0.5/6 *0,056/0,678*
04	0.110 *2,794*	0.062 *1,575*	15	0.084 *38*	4 860 *21,62*	2 380 *10,59*	0.5/6 *0,056/0,678*
05	0.110 *2,794*	0.093 *2,362*	14	0.102 *46*	7 180 *31,95*	3 020 *13,43*	1/15 *0,113/1,695*
06	0.110 *2,794*	0.093 *2,362*	8	0.161 *73*	8 550 *38,05*	3 570 *15,88*	1/15 *0,113/1,695*
07	0.110 *2,794*	0.093 *2,362*	10	0.212 *96*	12 000 *53,40*	4 800 *21,35*	1/15 *0,113/1,695*

2) W version

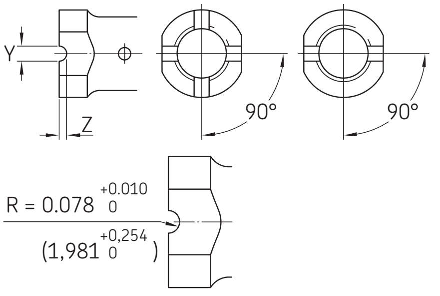
3.30 Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

PHFJ/WAS.. (PHUFJ/XRL.. or 12CF..)[1] bore code **08** to **16**

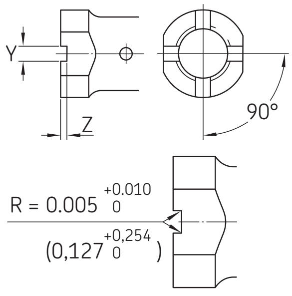


Technical specification	AS 81935
Product standard	AS 81935/7
Rod end body	PH13.8 passivated
Bearing	WAS..R inch (440C inner ring) EWAS..R inch (PH13.8 inner ring)

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



Rounded keyway



Square keyway

Dimensions

Nominal bore code	Dimensions							
	d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A Min	d_k ≈	r ±0.005 *±0,127*	H UNJF-3B
–	in/*mm*							–
08	0.5000 *12,700*	1.337 *33,960*	0.625 *15,875*	0.515 *13,081*	1.250 *31,750*	0.871 *22,130*	0.010 *0,254*	1/2-20 *12,7-20*
10	0.6250 *15,875*	1.525 *38,735*	0.750 *19,050*	0.577 *14,656*	1.375 *34,925*	1.059 *26,887*	0.254 *0,010*	5/8-18 *15,87-18*
12	0.7500 *19,050*	1.775 *45,085*	0.875 *22,225*	0.640 *16,256*	1.625 *41,275*	1.216 *30,897*	0.010 *0,254*	3/4-16 *19,05-16*
14	0.8750 *22,225*	2.025 *51,435*	0.875 *22,225*	0.765 *19,431*	1.875 *47,625*	1.325 *33,655*	0.010 *0,254*	7/8-14 *22,22-14*
16	1.0000 *25,400*	2.775 *70,485*	1.375 *34,925*	1.015 *25,781*	2.125 *53,975*	1.871 *47,526*	0.010 *0,254*	1.1/4-12 *31,75-12*

Dimensions cont.

Nominal bore code	Dimensions								
	g ≈	L ±0.010 *±0,254*	P ≈	F ±0.020 *±0,508*	S ±0.010 *±0,254*	T +0.002/–0.010 *+0,051/–0,254*	E +0.010/–0.062 *+0,254/–1,576*	Z[2] +0.005/0 *+0,127/0*	Y[1] +0.005/0 *+0,127/0*
–	in/*mm*								
08	0.07 *1,778*	2.250 *57,150*	0.880 *22,352*	0.562 *14,275*	0.735 *18,669*	0.750 *19,050*	0.250 *6,350*	- -	- -
10	0.07 *1,778*	2.500 *63,500*	1.020 *25,908*	0.687 *17,450*	0.860 *21,844*	0.875 *22,225*	0.375 *9,525*	0.077 *1,956*	0.125 *3,175*
12	0.07 *1,778*	2.875 *73,025*	1.160 *29,464*	0.812 *20,625*	0.985 *25,019*	1.000 *25,400*	0.375 *9,525*	0.077 *1,956*	0.125 *3,175*
14	0.07 *1,778*	3.375 *85,725*	1.300 *33,020*	0.937 *23,800*	1.110 *28,194*	1.125 *28,575*	0.500 *12,700*	0.086 *2,184*	0.156 *3,962*
16	0.07 *1,778*	4.125 *104,775*	2.020 *51,308*	1.312 *33,325*	1.688 *42,875*	1.750 *44,450*	0.563 *14,300*	0.116 *2,946*	0.187 *4,750*

[1] Parts are delivered and marked with PHUFJ/XRL.. or 12CF.. standard references

[2] K version

Cross-reference designation system to PHUFJ/XRL.. or 12CF..

Examples: EPHFJ/WAS04GK
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

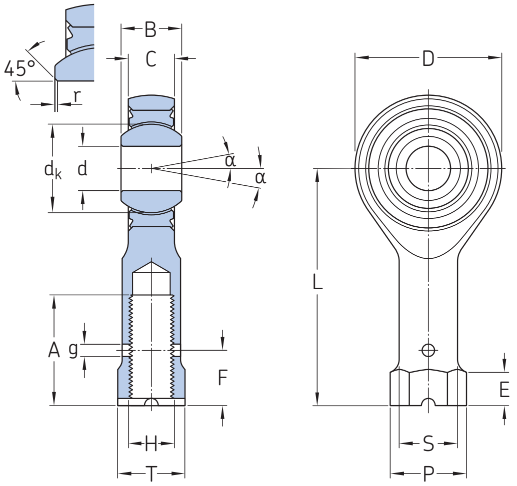
Dimensions cont., loads and torque

Nominal bore code	**Dimensions** Z[2] +0.005/0 *+0,127/0*	Y[2] +0.005/0 *+0,127/0*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*		°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
08	0.110 *2,794*	0.093 *2,362*	9	0.325 *147*	19 500 *86,70*	8 260 *36,74*	1/15 *0,113/1,695*
10	0.110 *2,794*	0.125 *3,175*	12	0.481 *218*	21 900 *97,45*	9 180 *40,83*	1/15 *0,113/1,695*
12	0.110 *2,794*	0.125 *3,175*	13	0.673 *305*	29 300 *130,38*	11 600 *51,60*	1/15 *0,113/1,695*
14	0.110 *2,794*	0.156 *3,962*	6	0.959 *435*	34 500 *153,52*	13 100 *58,27*	1/24 *0,113/2,712*
16	0.116 *2,946*	0.187 *4,750*	12	2.717 *1 232*	80 300 *357,31*	30 400 *135,22*	1/24 *0,113/2,712*

[2] W version

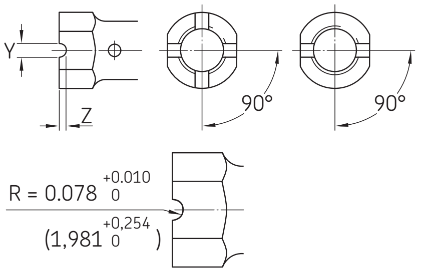
3.31 Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

FJ/NAS.. (UFJ/XRE.. or 12BNF..)[1] bore code **03** to **07**

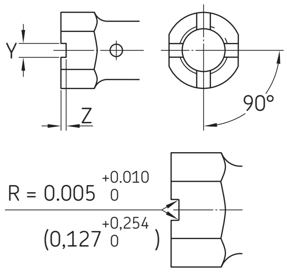


Technical specification	AS 81935
Product standard	AS 81935/5
Bearing	NAS..R inch (440C inner ring) ENAS..R inch (PH13.8 inner ring)

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 bore code	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A Min	d_k ≈	r ±0.005 *±0,127*	g ≈
–	in/*mm*							
03	0.1900 *4,826*	0.680 *17,272*	0.281 *7,137*	0.228 *5,791*	0.625 *15,875*	0.406 *10,312*	0.010 *0,254*	0.07 *1,778*
04	0.2500 *6,350*	0.827 *21,006*	0.343 *8,712*	0.260 *6,604*	0.625 *15,875*	0.500 *12,704*	0.010 *0,254*	0.07 *1,778*
05	0.3125 *7,937*	0.984 *24,994*	0.375 *9,525*	0.291 *7,391*	0.750 *19,050*	0.562 *14,283*	0.010 *0,254*	0.07 *1,778*
06	0.3750 *9,525*	1.131 *28,727*	0.406 *10,312*	0.322 *8,179*	1.000 *25,400*	0.625 *15,872*	0.010 *0,254*	0.07 *1,778*
07	0.4375 *11,112*	1.294 *32,868*	0.437 *11,100*	0.353 *8,966*	1.125 *28,575*	0.687 *17,448*	0.010 *0,254*	0.07 *1,778*

Dimensions cont.

Nominal bore code	Dimensions H UNJF-3B	L ±0.010 *±0,254*	P ≈	F ±0.020 *±0,508*	S ±0.010 *±0,254*	T +0.002/–0.010 *+0,051/–0,254*	E +0.010/–0.062 *+0,254/–1,576*	Z[2] +0.005/0 *+0,127/0*	Y[2] +0.005/0 *+0,127/0*
–	–	in/*mm*							
03	1/4-28 *6,35-28*	1.210 *30,734*	0.430 *10,922*	0.312 *7,925*	0.329 *8,357*	0.375 *9,525*	0.188 *4,775*	- -	- -
04	1/4-28 *6,35-28*	1.338 *33,985*	0.430 *10,922*	0.312 *7,925*	0.329 *8,357*	0.375 *9,525*	0.188 *4,775*	- -	- -
05	5/16-24 *7,94-24*	1.566 *39,774*	0.500 *12,700*	0.375 *9,525*	0.413 *10,490*	0.437 *11,100*	0.188 *4,775*	- -	- -
06	3/8-24 *9,52-24*	1.908 *48,463*	0.720 *18,288*	0.437 *11,100*	0.501 *12,725*	0.625 *15,875*	0.250 *6,350*	- -	- -
07	7/16-20 *11,11-20*	2.125 *53,975*	0.720 *18,288*	0.500 *12,700*	0.584 *14,834*	0.625 *15,875*	0.250 *6,350*	- -	- -

---

[1] Parts are delivered and marked with UFJ/XRE.. and 12BNF.. standard references

[2] K version

Cross-reference designation system to UFJ/XRE.. or 12BNF..

Examples: SEFJ/NAS04GK
FJ/NAS14

S E FJ/NAS 04 G K

Rod end body material and surface treatment

No code	Cadmium plated 4340 steel
S[3]	Zinc-nickel plated 4340 steel

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 type K
W	With deep keyway type W

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[3] SKF option

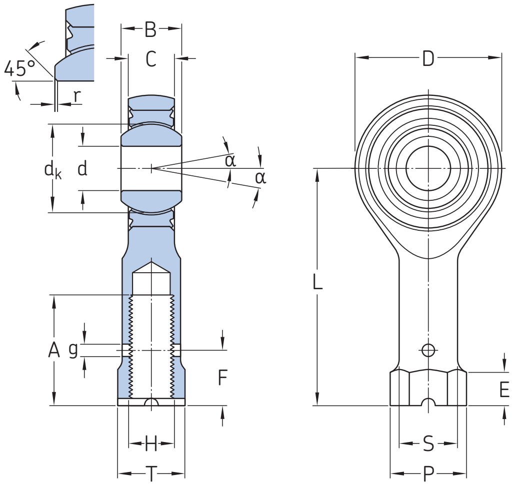
Dimensions cont., loads and torque

Nominal bore code	**Dimensions** Z[4] +0.005/0 *+0,127/0*	Y[4] +0.005/0 *+0,127/0*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*		°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.110 *2,794*	0.062 *1,575*	10	0.044 *20*	3 000 *13,34*	1 100 *4,89*	0.5/6 *0,056/0,678*
04	0.110 *2,794*	0.093 *2,362*	10	0.052 *24*	5 500 *24,46*	1 300 *5,78*	0.5/6 *0,056/0,678*
05	0.110 *2,794*	0.093 *2,362*	10	0.087 *40*	8 900 *39,59*	2 000 *8,90*	1/15 *0,113/1,695*
06	0.110 *2,794*	0.093 *2,362*	9	0.137 *62*	13 400 *59,60*	3 100 *13,79*	1/15 *0,113/1,695*
07	0.110 *2,794*	0.093 *2,362*	8	0.193 *88*	18 200 *80,95*	4 200 *18,68*	1/15 *0,113/1,695*

[4] W version

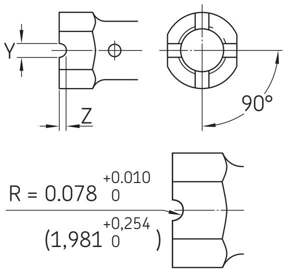
3.31 Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

FJ/NAS.. (UFJ/XRE.. or 12BNF..)[1] bore **08** to **16**

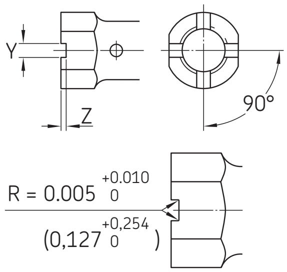


Technical specification	AS 81935
Product standard	AS 81935/5
Bearing	NAS..R inch (440C inner ring) ENAS..R inch (PH13.8 inner ring)

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 bore code	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A Min	d_k ≈	r ±0.005 *±0,127*	g ≈
–	in/*mm*							
08	0.5000 *12,700*	1.459 *37,059*	0.500 *12,700*	0.400 *10,160*	1.250 *31,750*	0.781 *19,838*	0.010 *0,254*	0.07 *1,778*
10	0.6250 *15,875*	1.763 *44,780*	0.625 *15,875*	0.510 *12,954*	1.375 *34,925*	0.968 *24,583*	0.010 *0,254*	0.07 *1,778*
12	0.7500 *19,050*	2.140 *54,356*	0.750 *19,050*	0.603 *15,316*	1.625 *41,275*	1.187 *30,149*	0.010 *0,254*	0.07 *1,778*
14	0.8750 *22,225*	2.372 *60,249*	0.875 *22,225*	0.713 *18,110*	1.875 *47,625*	1.314 *33,370*	0.010 *0,254*	0.07 *1,778*
16	1.0000 *25,400*	2.681 *68,097*	1.000 *25,400*	0.807 *20,498*	2.125 *53,975*	1.500 *38,099*	0.010 *0,254*	0.07 *1,778*

Dimensions cont.

Nominal bore code	Dimensions H UNJF-3B	L ±0.010 *±0,254*	P ≈	F ±0.020 *±0,508*	S ±0.010 *±0,254*	T +0.002/–0.010 *+0,051/–0,254*	E +0.010/–0.062 *+0,254/–1,576*	Z[2] +0.005/0 *+0,127/0*	Y[2] +0.005/0 *+0,127/0*
–	–	in/*mm*							
08	1/2-20 *12,7-20*	2.356 *59,842*	1.020 *25,908*	0.562 *14,275*	0.672 *17,069*	0.875 *22,225*	0.375 *9,525*	- -	- -
10	5/8-18 *15,87-18*	2.707 *68,758*	1.020 *25,908*	0.687 *17,450*	0.845 *21,463*	0.875 *22,225*	0.375 *9,525*	0.077 *1,956*	0.125 *3,175*
12	3/4-16 *19,05-16*	3.193 *81,102*	1.300 *33,020*	0.812 *20,625*	1.017 *25,832*	1.125 *28,575*	0.500 *12,700*	0.077 *1,956*	0.125 *3,175*
14	7/8-14 *22,22-14*	3.677 *93,396*	1.375 *34,925*	0.937 *23,800*	1.187 *30,150*	1.250 *31,750*	0.500 *12,700*	0.086 *2,184*	0.156 *3,962*
16	1-12 *25,4-12*	4.101 *104,165*	1.590 *40,386*	1.062 *26,975*	1.356 *34,442*	1.375 *34,925*	0.500 *12,700*	0.094 *2,388*	0.156 *3,962*

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[1] Parts are delivered and marked with UFJ/XRE.. and 12BNF.. standard references

[2] K version

Cross-reference designation system to UFJ/XRE.. or 12BNF..

Examples: SEFJ/NAS04GK
FJ/NAS14

S E FJ/NAS 04 G K

Rod end body material and surface treatment

No code	Cadmium plated 4340 steel
S3)	Zinc-nickel plated 4340 steel

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 type K
W	With deep keyway type W

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3) SKF option

Dimensions cont., loads and torque

Nominal bore code	**Dimensions** Z4) +0.005/0 +0,127/0	Y4) +0.005/0 *+0,127/0*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*		°	lb/*g*	lbf/*kN*		*lbf-in/Nm*
08	0.110 *2,794*	0.093 *2,362*	8	0.279 *127*	24 600 *109,42*	5 700 *25,35*	1/15 *0,113/1,695*
10	0.110 *2,794*	0.125 *3,175*	8	0.504 *229*	39 500 *175,70*	9 200 *40,92*	1/15 *0,113/1,695*
12	0.110 *2,794*	0.125 *3,175*	8	0.860 *390*	57 200 *254,43*	13 500 *60,05*	1/15 *0,113/1,695*
14	0.110 *2,794*	0.125 *3,175*	8	1.266 *574*	77 800 *346,05*	18 400 *81,85*	1/24 *0,113/2,712*
16	0.110 *2,794*	0.125 *3,175*	9	1.814 *823*	101 000 *449,25*	24 000 *106,75*	1/24 *0,113/2,712*

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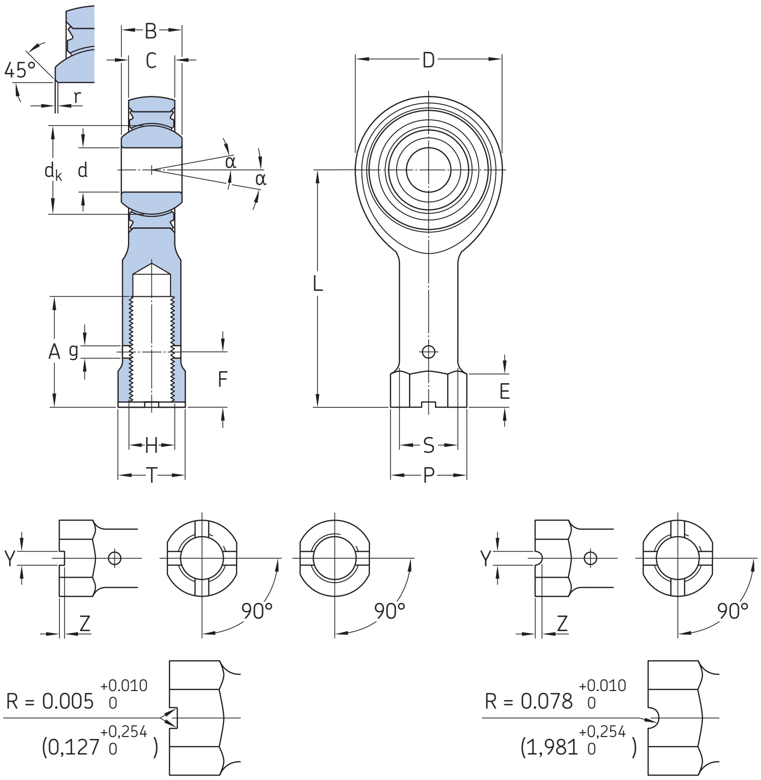
4) W version

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**



Rounded keyway

Square keyway

Technical specification	AS 81935
Product standard	AS 81935/9
Rod end body	PH13.8 passivated
Bearing	NAS..R inch (440C inner ring) 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 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A Min	dk ≈	r ±0.005 *±0,127*	g ≈
–	in/*mm*							
03	0.1900 *4,826*	0.680 *17,272*	0.281 *7,137*	0.228 *5,791*	0.625 *15,875*	0.406 *10,312*	0.010 *0,254*	0.07 *1,778*
04	0.2500 *6,350*	0.827 *21,006*	0.343 *8,712*	0.260 *6,604*	0.625 *15,875*	0.500 *12,704*	0.010 *0,254*	0.07 *1,778*
05	0.3125 *7,937*	0.984 *24,994*	0.375 *9,525*	0.291 *7,391*	0.750 *19,050*	0.562 *14,283*	0.010 *0,254*	0.07 *1,778*
06	0.3750 *9,525*	1.131 *28,727*	0.406 *10,312*	0.322 *8,179*	1.000 *25,400*	0.625 *15,872*	0.010 *0,254*	0.07 *1,778*
07	0.4375 *11,112*	1.294 *32,868*	0.437 *11,100*	0.353 *8,966*	1.125 *28,575*	0.687 *17,448*	0.010 *0,254*	0.07 *1,778*

Dimensions cont.

Nominal bore code	Dimensions H UNJF-3B	L ±0.010 *±0,254*	P ≈	F ±0.020 *±0,508*	S ±0.010 *±0,254*	T +0.002/–0.010 *+0,051/–0,254*	E +0.010/–0.062 *+0,254/–1,576*	Z[1] +0.005/0 *+0,127/0*	Y[1] +0.005/0 *+0,127/0*
–	–	in/*mm*							
03	1/4-28 *6,35-28*	1.210 *30,734*	0.430 *10,922*	0.312 *7,925*	0.329 *8,357*	0.375 *9,525*	0.188 *4,775*	– –	– –
04	1/4-28 *6,35-28*	1.338 *33,985*	0.430 *10,922*	0.312 *7,925*	0.329 *8,357*	0.375 *9,525*	0.188 *4,775*	– –	– –
05	5/16-24 *7,94-24*	1.566 *39,774*	0.500 *12,700*	0.375 *9,525*	0.413 *10,490*	0.437 *11,100*	0.188 *4,775*	– –	– –
06	3/8-24 *9,52-24*	1.908 *48,463*	0.720 *18,288*	0.437 *11,100*	0.501 *12,725*	0.625 *15,875*	0.250 *6,350*	– –	– –
07	7/16-20 *11,11-20*	2.125 *53,975*	0.720 *18,288*	0.500 *12,700*	0.584 *14,834*	0.625 *15,875*	0.250 *6,350*	– –	– –

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[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
PHFJ/NAS14

E PHFJ/NAS 04 G K

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 type K
W With deep keyway type W

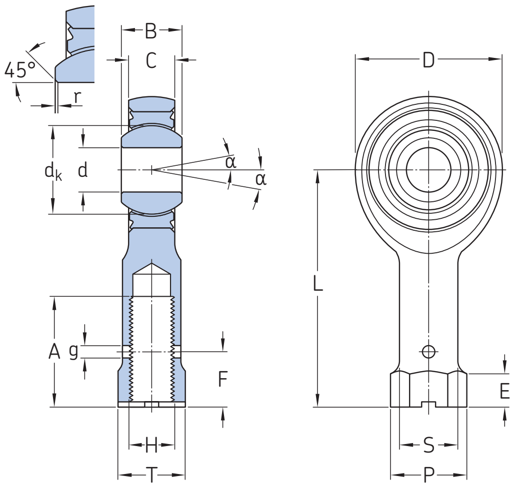
Dimensions cont., loads and torque

Nominal bore code	Dimensions Z[3)] +0.005/0 +0,127/0	 Y[3)] +0.005/0 *+0,127/0*	α	Mass ≈	Radial loads Ultimate	 Fatigue 50 000 cycles	Starting torque
–	in/*mm*		°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.110 *2,794*	0.062 *1,575*	10	0.044 *20*	3 000 *13,34*	1 100 *4,89*	0.5/6 *0,056/0,678*
04	0.110 *2,794*	0.093 *2,362*	10	0.052 *24*	5 500 *24,46*	1 300 *5,78*	0.5/6 *0,056/0,678*
05	0.110 *2,794*	0.093 *2,362*	10	0.087 *40*	8 900 *39,59*	2 000 *8,9*	1/15 *0,113/1,695*
06	0.110 *2,794*	0.093 *2,362*	9	0.137 *62*	13 400 *59,60*	3 100 *13,79*	1/15 *0,113/1,695*
07	0.110 *2,794*	0.093 *2,362*	8	0.193 *88*	18 200 *80,95*	4 200 *18,68*	1/15 *0,113/1,695*

[3)] W version

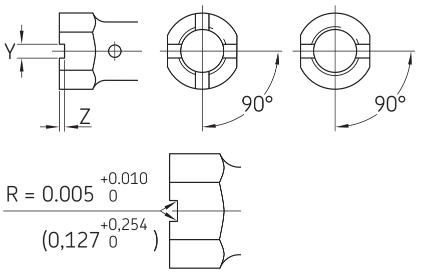
3.32 Internal thread inserted narrow self-lubricating spherical plain bearing rod end (inch dimensions)

PHFJ/NAS.. (PHUFJ/XRE.. or 12CNF..)[2] bore code **08** to **16**

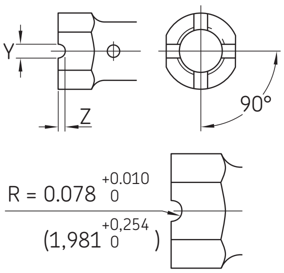


Technical specification	AS 81935
Product standard	AS 81935/9
Rod end body	PH13.8 passivated
Bearing	NAS..R inch (440C inner ring) ENAS..R inch (PH13.8 inner ring)

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 bore code	Dimensions d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A Min	d_k ≈	r ±0.005 *±0,127*	g ≈
–	in/*mm*							
08	0.5000 *12,700*	1.459 *37,059*	0.500 *12,700*	0.400 *10,160*	1.250 *31,750*	0.781 *19,838*	0.010 *0,254*	0.07 *1,778*
10	0.6250 *15,875*	1.763 *44,780*	0.625 *15,875*	0.510 *12,954*	1.375 *34,925*	0.968 *24,583*	0.010 *0,254*	0.07 *1,778*
12	0.7500 *19,050*	2.140 *54,356*	0.750 *19,050*	0.603 *15,316*	1.625 *41,275*	1.187 *30,149*	0.010 *0,254*	0.07 *1,778*
14	0.8750 *22,225*	2.372 *60,249*	0.875 *22,225*	0.713 *18,110*	1.875 *47,625*	1.314 *33,370*	0.010 *0,254*	0.07 *1,778*
16	1.0000 *25,400*	2.681 *68,097*	1.000 *25,400*	0.807 *20,498*	2.125 *53,975*	1.500 *38,099*	0.010 *0,254*	0.07 *1,778*

Dimensions cont.

Nominal bore code	Dimensions H UNJF-3B	L ±0.010 *±0,254*	P ≈	F ±0.020 *±0,508*	S ±0.010 *±0,254*	T +0.002/–0.010 *+0,051/–0,254*	E +0.010/–0.062 *+0,254/–1,576*	Z[1] +0.005/0 *+0,127/0*	Y[1] +0.005/0 *+0,127/0*
–	–	in/*mm*							
08	1/2-20 *12,7-20*	2.356 *59,842*	1.020 *25,908*	0.562 *14,275*	0.672 *17,069*	0.875 *22,225*	0.375 *9,525*	– –	– –
10	5/8-18 *15,87-18*	2.707 *68,758*	1.020 *25,908*	0.687 *17,450*	0.845 *21,463*	0.875 *22,225*	0.375 *9,525*	0.077 *1,956*	0.125 *3,175*
12	3/4-16 *19,05-16*	3.193 *81,102*	1.300 *33,020*	0.812 *20,625*	1.017 *25,832*	1.125 *28,575*	0.500 *12,700*	0.077 *1,956*	0.125 *3,175*
14	7/8-14 *22,22-14*	3.677 *93,396*	1.375 *34,925*	0.937 *23,800*	1.187 *30,150*	1.250 *31,750*	0.500 *12,700*	0.086 *2,184*	0.156 *3,962*
16	1-12 *25,4-12*	4.101 *104,165*	1.590 *40,386*	1.062 *26,975*	1.356 *34,442*	1.375 *34,925*	0.500 *12,700*	0.094 *2,388*	0.156 *3,962*

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[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
PHFJ/NAS14

E PHFJ/NAS 04 G K

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 type K
W	With deep keyway type W

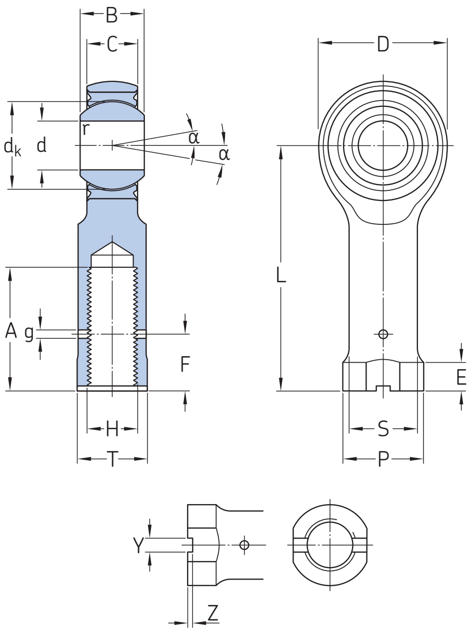
Dimensions cont., loads and torque

Nominal bore code	**Dimensions** Z3) +0.005/0 *+0,127/0*	 Y3) +0.005/0 *+0,127/0*	α	**Mass** ≈	**Radial loads** Ultimate	 Fatigue 50 000 cycles	**Starting torque**
–	in/*mm*		°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
08	0.110 *2,794*	0.093 *2,362*	8	0.279 *127*	24 600 *109,42*	5 700 *25,35*	1/15 *0,113/1,695*
10	0.110 *2,794*	0.125 *3,175*	8	0.504 *229*	39 500 *175,70*	9 200 *40,92*	1/15 *0,113/1,695*
12	0.110 *2,794*	0.125 *3,175*	8	0.860 *390*	57 200 *254,43*	13 500 *60,05*	1/15 *0,113/1,695*
14	0.110 *2,794*	0.156 *3,962*	8	1.266 *574*	77 800 *346,05*	18 400 *81,85*	1/24 *0,113/2,712*
16	0.110 *2,794*	0.156 *3,962*	9	1.814 *823*	101 000 *449,25*	24 000 *106,75*	1/24 *0,113/2,712*

[3] 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 *0/–0,0127*	0/–0.002 *0/–0,051*	±0.010 *±0,254*	±0.005 *±0,127*	±0.010 *±0,254*		±0.010 *±0,254*	±0.010 *±0,254*
–	in/*mm*							
03	0.1900 *4,826*	0.437 *11,099*	0.806 *20,472*	0.337 *8,560*	1.375 *34,925*	0.005/0.015 *0,127/0,381*	0.437 *11,099*	0.500 *12,700*
04	0.2500 *6,350*	0.437 *11,099*	0.806 *20,472*	0.337 *8,560*	1.469 *37,312*	0.005/0.015 *0,127/0,381*	0.437 *11,099*	0.500 *12,700*
05	0.3125 *7,937*	0.437 *11,099*	0.900 *22,860*	0.327 *8,306*	1.375 *34,925*	0.005/0.015 *0,127/0,381*	0.437 *11,099*	0.500 *12,700*
06	0.3750 *9,525*	0.500 *12,700*	1.025 *26,035*	0.416 *10,566*	1.625 *41,275*	0.005/0.015 *0,127/0,381*	0.582 *14,782*	0.625 *15,875*
07	0.4375 *11,112*	0.562 *14,274*	1.150 *29,210*	0.452 *11,481*	1.812 *46,024*	0.005/0.015 *0,127/0,381*	0.625 *15,875*	0.687 *17,449*
08	0.5000 *12,700*	0.625 *15,875*	1.337 *33,960*	0.515 *13,081*	2.125 *53,975*	0.005/0.015 *0,127/0,381*	0.750 *19,050*	0.812 *20,624*

Dimensions cont.

Nominal bore code	**Dimensions** F	E	H	A	S	d_k	Z	Y
	±0.015 *±0,381*	±0.010 *±0,254*	UNJF-3B	+0.060/–0.030 *+1,524/–0,762*	+0.005/–0.005 *+0,127/–0,127*	≈	+0.005/0 *+0,127/0*	+0.005/0 *+0,127/0*
–	in/*mm*		–	in/*mm*				
03	0.380 *9,652*	0.250 *6,350*	5/16-24	0.750 *19,050*	0.422 *10,718*	0.531 *13,487*	0.056 *1,422*	0.062 *1,574*
04	0.380 *9,652*	0.250 *6,350*	5/16-24	0.750 *19,050*	0.422 *10,718*	0.531 *13,487*	0.056 *1,422*	0.062 *1,574*
05	0.380 *9,652*	0.250 *6,350*	5/16-24	0.750 *19,050*	0.422 *10,718*	0.593 *15,062*	0.056 *1,422*	0.062 *1,574*
06	0.440 *11,176*	0.250 *6,350*	3/16-24	0.937 *23,799*	0.567 *14,401*	0.687 *17,449*	0.056 *1,422*	0.093 *2,362*
07	0.500 *12,700*	0.250 *6,350*	7/16-20	1.062 *26,975*	0.610 *15,494*	0.781 *19,837*	0.069 *1,752*	0.093 *2,362*
08	0.560 *14,224*	0.250 *6,350*	1/2-20	1.125 *28,575*	0.735 *18,669*	0.875 *22,225*	0.069 *1,752*	0.093 *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 code1)	No treatment
C	Cadmium plated
J1)	Zinc-nickel plated

Keyway

No code	Without keyway
K1)	With keyway

Rod end body material

No code1)	Corrosion-resistant steel 17-4PH H1025
S	Alloy steel

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1) SKF option

Dimensions cont., loads and torque

Nominal bore code	**Dimensions** g ≈	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 50 000 cycles	**Starting torque**2) Max
–	in/*mm*	°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
03	0.07 *1,778*	17	0.06 *27,21*	4 800 *21,35*	1 470,25 *6,54*	6 *0,677*
04	0.07 *1,778*	17	0.06 *27,21*	4 800 *21,35*	2 380,73 *10,59*	6 *0,677*
05	0.07 *1,778*	14	0.07 *31,75*	5 500 *24,47*	2 769,65 *12,32*	10 *1,129*
06	0.07 *1,778*	10	0.11 *49,89*	7 000 *31,14*	3 569,97 *15,88*	10 *1,129*
07	0.07 *1,778*	12	0.18 *81,64*	8 100 *36,03*	4 799,67 *21,35*	10 *1,129*
08	0.07 *1,778*	9	0.28 *127*	14 200 *63,16*	7 679,48 *34,16*	10 *1,129*

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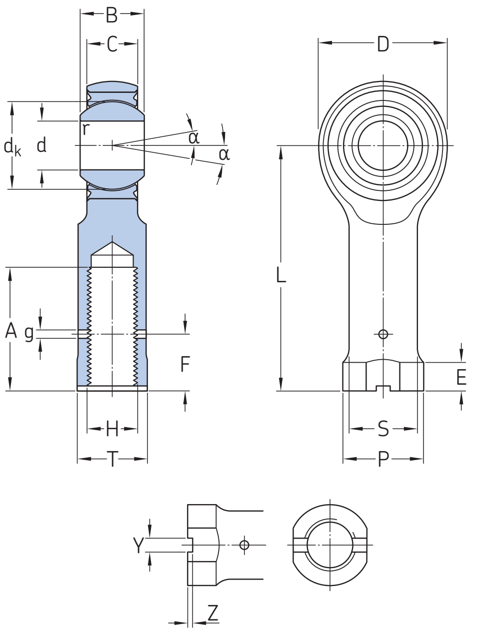
2) Minimum starting torque limited by zero radial and axial clearance.

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 0/–0.0005 *0/–0,0127*	B 0/–0.002 *0/–0,051*	D ±0.010 *±0,254*	C ±0.005 *±0,127*	L ±0.010 *±0,254*	r	T ±0.010 *±0,254*	P ±0.010 *±0,254*
–	in/*mm*							
10	0.6250 *15,875*	0.750 *19,050*	1.525 *38,735*	0.577 *14,656*	2.625 *66,675*	0.005/0.015 *0,127/0,381*	0.875 *22,225*	1.000 *25,400*
12	0.7500 *19,050*	0.875 *22,225*	1.775 *45,085*	0.640 *16,256*	2.875 *73,025*	0.005/0.015 *0,127/0,381*	1.000 *25,400*	1.060 *26,924*
14	0.8750 *22,225*	0.875 *22,225*	2.025 *51,435*	0.765 *19,431*	3.375 *85,725*	0.005/0.015 *0,127/0,381*	1.125 *28,575*	1.187 *30,150*
16[1]	1.0000 *25,400*	1.375 *34,925*	2.775 *70,485*	1.015 *25,781*	4.125 *104,775*	0.005/0.015 *0,127/0,381*	1.500 *38,100*	1.625 *41,275*
16B	1.0000 *25,400*	1.375 *34,925*	2.775 *70,485*	1.015 *25,781*	4.125 *104,775*	0.005/0.015 *0,127/0,381*	1.250 *31,750*	1.312 *33,325*

Dimensions cont.

Nominal bore code	Dimensions F ±0.015 *±0,381*	E ±0.010 *±0,254*	H UNJF-3B	A +0.060/–0.030 *+1,524/–0,762*	S +0.005/–0.005 *+0,127/–0,127*	d_k ≈	Z +0.005/0 *+0,127/0*	Y +0.005/0 *+0,127/0*
–	in/*mm*		–	in/*mm*				
10	0.690 *17,526*	0.250 *6,350*	5/8-20	1.500 *38,100*	0.860 *21,844*	1.062 *26,974*	0.077 *1,955*	0.125 *3,175*
12	0.820 *20,828*	0.250 *6,350*	3/4-16	1.620 *41,148*	0.985 *25,019*	1.250 *31,750*	0.077 *1,955*	0.125 *3,175*
14	0.940 *23,876*	0.250 *6,350*	7/8-14	1.875 *47,625*	1.110 *28,194*	1.375 *34,925*	0.086 *2,184*	0.156 *3,962*
16[1]	1.070 *27,178*	0.250 *6,350*	1 1/4-12	2.125 *53,975*	1.485 *37,719*	1.937 *49.200*	0.094 *2,387*	0.156 *3,962*
16B	1.070 *27,178*	0.250 *6,350*	1 -12	2.125 *53,975*	1.485 *37,719*	1.937 *49.200*	0.094 *2,387*	0.156 *3,962*

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[1] SKF option

Designation system

Examples: R03FLCKS
R12FR

R 03 F L C K S

Basic designation – R

Bore code (multiples of 1/16 inch) – 03

Thread direction – L
R Right-hand thread
L Left-hand thread

Surface treatment of rod end body – C
No code[1] No treatment
C Cadmium plated
J[1] Zinc-nickel plated

Keyway – K
No code Without keyway
K[1] With keyway

Rod end body material – S
No code[1] Corrosion-resistant steel 17-4PH H1025
S Alloy steel

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[1] SKF option

Dimensions cont., loads and torque

Nominal bore code	**Dimensions** g ≈	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 50 000 cycles	**Starting torque**[2] Max
–	in/*mm*	°	lb/*g*	lbf/*kN*		lbf-in/*Nm*
10	0.07 *1,778*	12	0.42 *190,50*	16 150 *71,84*	9 178,95 *40,83*	10 *1,129*
12	0.07 *1,778*	14	0.51 *231,33*	21 000 *93,41*	11 600,14 *51,6*	10 *1,129*
14	0.07 *1,778*	7	0.94 *426,37*	26 000 *115,65*	13 099,62 *58,27*	16 *1,807*
16[1]	0.07 *1,778*	15	1.35 *612,34*	55 500 *246,88*	30 400,92 *135,23*	16 *1,807*
16B	0.07 *1,778*	15	1.35 *612,34*	55 500 *246,88*	30 400,92 *135,23*	16 *1,807*

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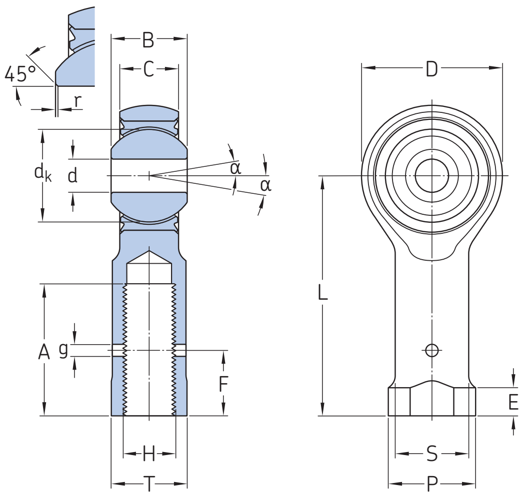
[2] Minimum starting torque limited by zero radial and axial clearance.

3.34 Internal thread inserted wide self-lubricating spherical plain bearing rod end (inch dimensions)

EFJ/RL..R



Technical specification	AS 81820 for the bearing
Product standard	–
Bearing	WAS..R inch

Dimensions

Nominal bore code	**Dash number** multiples of 1/16 inch	**Dimensions** d 0/–0.0005 *0/–0,0127*	D ±0.010 *±0,254*	B 0/–0.002 *0/–0,051*	C ±0.005 *±0,127*	A +0.06/–0.03 *+1,524/–0,762*	d_k ≈	r ±0.005 *±0,127*	H UNJF-3B	L ±0.010 *±0,254*	P ±0.010 *±0,254*
–		in/*mm*							–	in/*mm*	
4,83	**03**	0.1900 *4,826*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.750 *19,050*	0.530 *13,464*	0.010 *0,254*	5/16-24 *7,94-24*	1.375 *34,925*	0,500 *12,700*
6,35	**04**	0.2500 *6,350*	0.806 *20,472*	0.437 *11,100*	0.337 *8,56*	0.750 *19,050*	0.530 *13,464*	0.010 *0,254*	5/16-24 *7,94-24*	1.469 *37,312*	0,500 *12,700*
7,94	**05**	0.3125 *7,937*	0.900 *22,860*	0.437 *11,100*	0.327 *8,306*	0.750 *19,050*	0.566 *14,381*	0.010 *0,254*	5/16-24 *7,94-24*	1.375 *34,925*	0,500 *12,700*
9,52	**06**	0.3750 *9,525*	1.025 *26,035*	0.500 *12,700*	0.416 *10,566*	0.937 *23,780*	0.683 *17,361*	0.010 *0,254*	3/8-24 *9,52-24*	1.625 *41,275*	0,625 *15,875*
11,11	**07**	0.4375 *11,112*	1.150 *29,210*	0.562 *14,275*	0.452 *11,481*	1.062 *26,975*	0.777 *19,744*	0.010 *0,254*	7/16-20 *11,11-20*	1.812 *46,025*	0,687 *17,450*
12,7	**08**	0.5000 *12,700*	1.337 *33,960*	0.625 *15,875*	0.515 *13,081*	1.125 *28,575*	0.871 *22,130*	0.010 *0,254*	1/2-20 *12,7-20*	2.125 *53,975*	0,812 *20,625*
15,87	**10**	0.6250 *15,875*	1.525 *38,735*	0.750 *19,050*	0.577 *14,656*	1.500 *38,100*	1.059 *26,887*	0.010 *0,254*	5/8-18 *15,87-18*	2.625 *66,675*	1,000 *25,400*
19,05	**12**	0.7500 *19,050*	1.775 *45,085*	0.875 *22,225*	0.640 *16,256*	1.620 *41,148*	1.216 *30,897*	0.010 *0,254*	3/4-16 *19,05-16*	2.875 *73,025*	1,060 *26,924*
22,22	**14**	0.8750 *22,225*	2.025 *51,435*	0.875 *22,225*	0.765 *19,431*	1.875 *47,625*	1.325 *33,655*	0.010 *0,254*	7/8-14 *22,22-14*	3.375 *85,725*	1,187 *30,150*
25,4	**16**	1.0000 *25,400*	2.775 *70,485*	1.375 *34,925*	1.015 *25,781*	2.125 *53,975*	1.871 *47,526*	0.010 *0,254*	1-12 *25,4-12*	4.125 *104,775*	1,312 *33,325*

Designation system

Examples:	XEFJ/RL6,35RGX EFJ/RL22,22	X	EFJ/RL	6,35	R	G	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[1]	Anodized titanium

Basic designation

Bore code

Thread direction

No code	Right-hand thread
G	Left-hand thread

Starting torque

No code	Standard
X	Reduced

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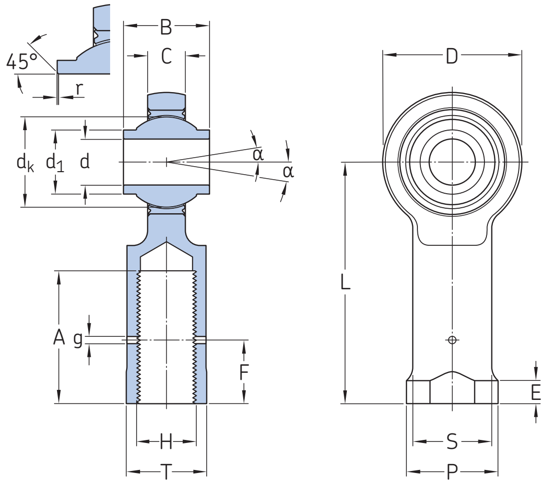
[1] SKF option, masses and load carrying capability reduced compared to steel rod end body

Dimensions cont., loads and torque

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions F ±0.015 *±0,381*	E ≈	S ±0.005 *±0,127*	T +0.003/–0.010 *+1,524/–0,762*	g ≈	α	Mass ≈	Radial loads Ultimate	Fatigue 10^6 cycles	Starting torque Standard	Reduced
–		in/*mm*					°	lb/*g*	lbf/*kN*		lbf-in/*Nm*	
4,83	**03**	0,380 *9,652*	0.25 6,35	0,422 *10,719*	0,437 *11,100*	0.07 *1,778*	16	0,07 *32*	6 195 *27,56*	1 052 *4,68*	0.53/ 10 *0,06/ 1,12*	1.1 max *0,12 max*
6,35	**04**	0,380 *9,652*	0.25 6,35	0,422 *10,719*	0,437 *11,100*	0.07 *1,778*	16	0,07 *32*	6 195 *27,56*	1 052 *4,68*	0.53/ 10 *0,06/ 1,12*	1.1 max *0,12 max*
7,94	**05**	0,380 *9,652*	0.25 6,35	0,422 *10,719*	0,437 *11,100*	0.07 *1,778*	15	0,10 *45*	7 585 *33,74*	1 090 *4,85*	1/ 10 *0,11/ 1,12*	2 max *0,22 max*
9,52	**06**	0,440 *11,176*	0.25 6,35	0,567 *14,402*	0,582 *14,782*	0.07 *1,778*	9	0,12 *55*	8 940 *39,78*	1 513 *6,73*	1/ 10 *0,11/ 1,12*	2 max *0,22 max*
11,11	**07**	0,500 *12,700*	0.25 6,35	0,610 *15,494*	0,625 *15,875*	0.07 *1,778*	11	0,20 *92*	9 595 *42,68*	1 920 *8,54*	1/ 10 *0,11/ 1,12*	2 max *0,22 max*
12,7	**08**	0,560 *14,224*	0.25 6,35	0,735 *18,669*	0,750 *19,050*	0.07 *1,778*	9	0,28 *140*	18 750 *83,42*	3 069 *13,65*	1/ 10 *0,11/ 1,12*	2 max *0,22 max*
15,87	**10**	0,690 *17,526*	0.25 6,35	0,860 *21,844*	0,875 *22,225*	0.07 *1,778*	12	0,45 *205*	20 680 *91,99*	3 480 *15,48*	1/ 10 *0,11/ 1,12*	2 max *0,22 max*
19,05	**12**	0,820 *20,828*	0.25 6,35	0,985 *25,019*	1,000 *25,400*	0.07 *1,778*	13	0,55 *250*	27 795 *123,65*	4 586 *20,40*	1/ 10 *0,11/ 1,12*	2 max *0,22 max*
22,22	**14**	0,940 *23,876*	0.25 6,35	1,110 *28,194*	1,125 *28,575*	0.07 *1,778*	6	1,00 *450*	31 725 *141,13*	5 348 *23,79*	2/ 15.9 *0,23/ 1,8*	4.1 max *0,46 max*
25,4	**16**	1,070 *27,178*	0.25 6,35	1,235 *31,369*	1,250 *31,750*	0.07 *1,778*	12	1,45 *660*	71 745 *319,16*	8 377 *37,26*	2/ 15.9 *0,23/ 1,8*	4.1 max *0,46 max*

3.35 Internal thread inserted high misalignment self-lubricating spherical plain bearing rod end (inch dimensions)

EFJ/RT..R



Technical specification	AS 81820 for the bearing
Product standard	–
Bearing	XRT..R inch

Dimensions

Nominal bore code	Dash number multiples of 1/16 inch	Dimensions d 0/–0.0005 *0/–0,0127*	D +0.035/–0.010 *+889/–0.254*	B 0/–0.005 *0/–0,127*	C ±0.005 *±0,127*	A +0.06/–0.03 *+1,524/–0,762*	H UNJF-3B	d_k ≈	d_1 ≈	r +0.012/0 *+0,3/0*	L ±0.010 *±0,254*	P ±0.010 *±0,254*
–		in/*mm*					–	in/*mm*				
4,83	**03**	0.1900 *4,826*	0.750 *19,050*	0.500 *12,700*	0.220 *5,588*	0.750 *19,050*	5/16-24 *7,94-24*	0.437 *11,100*	0.315 *8,001*	0.004 *0,100*	1.375 *34,925*	0.500 *12,700*
6,35	**04**	0.2500 *6,350*	1.000 *25,400*	0.593 *15,062*	0.265 *6,731*	0.937 *23,780*	3/8-24 *9,52-24*	0.594 *15,080*	0.386 *9,804*	0.004 *0,100*	1.625 *41,275*	0.625 *15,875*
7,94	**05**	0.3125 *7,937*	1.125 *28,575*	0.813 *20,650*	0.355 *9,017*	1.062 *26,975*	7/16-20 *11,11-20*	0.781 *19,838*	0.512 *13,005*	0.004 *0,100*	1.812 *46,025*	0.687 *17,450*
9,52	**06**	0.3750 *9,525*	1.125 *28,575*	0.813 *20,650*	0.355 *9,017*	1.062 *26,975*	7/16-20 *11,11-20*	0.781 *19,838*	0.532 *13,513*	0.004 *0,100*	1.812 *46,025*	0.687 *17,450*
11,11	**07**	0.4375 *11,112*	1.312 *33,325*	0.875 *22,225*	0.355 *9,017*	1.125 *28,575*	1/2-20 *12,7-20*	0.866 *22,000*	0.620 *15,748*	0.004 *0,100*	2.125 *53,975*	0.812 *20,625*
12,7	**08**	0.5000 *12,700*	1.500 *38,100*	0.937 *23,799*	0.411 *10,439*	1.500 *38,100*	5/8-18 *15,87-18*	0.984 *25,000*	0.728 *18,491*	0.004 *0,100*	2.625 *66,675*	1.000 *25,400*
15,87	**10**	0.6250 *15,875*	1.750 *44,450*	1.200 *30,480*	0.577 *14,656*	1.750 *44,450*	3/4-16 *19,05-16*	1.240 *31,500*	0.857 *21,768*	0.004 *0,100*	2.875 *73,025*	1.060 *26,924*
19,05	**12**	0.7500 *19,050*	2.000 *50,800*	1.280 *32,512*	0.630 *16,002*	1.875 *47,625*	7/8-14 *22,22-14*	1.339 *34,000*	0.963 *24,460*	0.004 *0,100*	3.375 *85,725*	1.187 *30,150*
22,22	**14**	0.8750 *22,225*	2.200 *55,880*	1.400 *35,560*	0.635 *16,219*	2.000 *50,800*	7/8-14 *22,22-14*	1.531 *38,900*	1.122 *28,500*	0.004 *0,100*	3.375 *85,725*	1.187 *30,150*
25,4	**16**	1.0000 *25,400*	2.750 *69,850*	1.875 *47,625*	0.845 *21,463*	2.125 *53,975*	1.1/4-12 *31,75-12*	1.875 *47,625*	1.272 *32,309*	0.004 *0,100*	4.125 *104,775*	2.020 *51,308*

Designation system

Examples:	XEFJ/RT6,35RGX EFJ/RT22,22	X EFJ/RT 6,35 R G 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[1]	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** multiples of 1/16 inch	**Dimensions** g ≈	F ±0.015 *±0,381*	E ≈	S ±0.005 *±0,127*	T ±0.010 *±0,254*	α	**Mass** ≈	**Radial loads** Ultimate	Fatigue 10^6 cycles	**Starting torque** Standard	Reduced
–		in/*mm*					°	lb/*g*	lbf/*kN*		lbf-in/*Nm*	
4,83	03	0.07 *1,778*	0.380 *9,652*	0.25 *6,35*	0.422 *10,719*	0.437 *11,100*	15	0.07 *31*	4800 *21,35*	762 *3,39*	0.53/5 *0,06/0,56*	1 max *0,12 max*
6,35	04	0.07 *1,778*	0.440 *11,176*	0.25 *6,35*	0.567 *14,402*	0.582 *14,782*	24	0.13 *60*	8185 *36,40*	1 311 *5,83*	0.53/5 *0,06/0,56*	1 max *0,12 max*
7,94	05	0.07 *1,778*	0.500 *12,700*	0.25 *6,35*	0.610 *15,494*	0.625 *15,875*	23	0.19 *85*	8620 *38,34*	1 414 *6,29*	0.7/7 *0,08/0,8*	2 max *0,22 max*
9,52	06	0.07 *1,778*	0.500 *12,700*	0.25 *6,35*	0.610 *15,494*	0.625 *15,875*	22	0.19 *85*	8620 *38,34*	1 414 *6,29*	0.88/9 *0,10/1,02*	2 max *0,22 max*
11,11	07	0.07 *1,778*	0.560 *14,224*	0.25 *6,35*	0.735 *18,669*	0.750 *19,050*	22	0.31 *140*	13025 *57,93*	2 104 *9,36*	0.88/9 *0,10/1,02*	2 max *0,22 max*
12,7	08	0.07 *1,778*	0.690 *17,526*	0.25 *6,35*	0.860 *21,844*	0.875 *22,225*	20	0.49 *220*	18165 *80,80*	2 947 *13,11*	0.88/9 *0,10/1,02*	2 max *0,22 max*
15,87	10	0.07 *1,778*	0.820 *20,828*	0.25 *6,35*	0.985 *25,019*	1.000 *25,400*	20	0.71 *321*	24010 *106,80*	3 973 *17,67*	1/12.4 *0,11/1,4*	2 max *0,22 max*
19,05	12	0.07 *1,778*	0.940 *23,876*	0.25 *6,35*	1.110 *28,194*	1.125 *28,575*	19	0.97 *440*	26990 *120,05*	5 052 *22,47*	1/12.4 *0,11/1,4*	2 max *0,22 max*
22,22	14	0.07 *1,778*	0.940 *23,876*	0.25 *6,35*	1.110 *28,194*	1.125 *28,575*	19	1.11 *501*	28880 *128,46*	5 295 *23,55*	2.21/18 *0,25/2,04*	4 max *0,46 max*
25,4	16	0.07 *1,778*	1.070 *27,178*	0.25 *6,35*	1.688 *42,875*	1.250 *31,750*	21	2.00 *908*	60230 *267,90*	9 858 *43,85*	2.21/18 *0,25/2,04*	4 max *0,46 max*

Cross-reference

Ball bearing rod ends

Metric bearings

EN part number		SKF designation
EN3541L**d’**EKA		C**d**MJEGRKN741
EN3541L**d’**EKB		C**d**MJEGRKN811
EN3541L**d’**EA		C**d**MJEGRN741
EN3541L**d’**EB		C**d**MJEGRN811
EN3541L**d’**PKA		C**d**MJGRKN741
EN3541L**d’**PKB		C**d**MJGRKN811
EN3541L**d’**PA		C**d**MJGRN741
EN3541L**d’**PB		C**d**MJGRN811
EN3541R**d’**EKA		C**d**MJERKN741
EN3541R**d’**EKB		C**d**MJERKN811
EN3541R**d’**EA		C**d**MJERN741
EN3541R**d’**EB		C**d**MJERN811
EN3541R**d’**PKA		C**d**MJRKN741
EN3541R**d’**PKB		C**d**MJRKN811
EN3541R**d’**PA		C**d**MJRN741
EN3541R**d’**PB		C**d**MJRN811
EN4036L**d’**EKA	EN4036L**d’**EKAT	XC**d**MJEGRKN741
EN4036L**d’**EKB	EN4036L**d’**EKBT	XC**d**MJEGRKN811
EN4036L**d’**ENA	EN4036L**d’**ENAT	XC**d**MJEGRN741
EN4036L**d’**ENB	EN4036L**d’**ENBT	XC**d**MJEGRN811
EN4036L**d’**EMA	EN4036L**d’**EMAT	XC**d**MJEGRK2N741
EN4036L**d’**EMB	EN4036L**d’**EMBT	XC**d**MJEGRK2N811
EN4036L**d’**PKA	EN4036L**d’**PKAT	XC**d**MJGRKN741
EN4036L**d’**PKB	EN4036L**d’**PKBT	XC**d**MJGRKN811
EN4036L**d’**PNA	EN4036L**d’**PNAT	XC**d**MJGRN741
EN4036L**d’**PNB	EN4036L**d’**PNBT	XC**d**MJGRN811
EN4036L**d’**PMA	EN4036L**d’**EMAT	XC**d**MJGRK2N741

EN part number		SKF designation
EN4036L**d’**PMB	EN4036L**d’**EMBT	XC**d**MJGRK2N811
EN4036R**d’**EKA	EN4036R**d’**EKAT	XC**d**MJERKN741
EN4036R**d’**EKB	EN4036R**d’**EKBT	XC**d**MJERKN811
EN4036R**d’**ENA	EN4036R**d’**ENAT	XC**d**MJERN741
EN4036R**d’**ENB	EN4036R**d’**ENBT	XC**d**MJERN811
EN4036R**d’**EMA	EN4036R**d’**EMAT	XC**d**MJERK2N741
EN4036R**d’**EMB	EN4036R**d’**EMBT	XC**d**MJERK2N811
EN4036R**d’**PKA	EN4036R**d’**PKAT	XC**d**MJRKN741
EN4036R**d’**PKB	EN4036R**d’**PKBT	XC**d**MJRKN811
EN4036R**d’**PNA	EN4036R**d’**PNAT	XC**d**MJRN741
EN4036R**d’**PNB	EN4036R**d’**PNBT	XC**d**MJRN811
EN4036R**d’**PMA	EN4036R**d’**EMAT	XC**d**MJRK2N741
EN4036R**d’**PMB	EN4036R**d’**EMBT	XC**d**MJRK2N811

Where
d = Bore code
d’ = 05 for bore code = 5, 06 for bore code = N6,
08 for bore code = N8, 10 for bore code = N10

Example

EN part number		SKF designation
EN3541L**05**EKA		C**5**MJEGRKN741
EN4036R**08**PMB	EN4036R**08**EMBT	XCN**8**MJRK2N811
EN4036L**10**EMB	EN4036L**10**EMBT	XCN**10**MJEGRK2N811

EN part number	SKF designation
EN4156L**d’**EK1AR	WCN**d**ExGKG74
EN4156L**d’**EK2AR	WCN**d**ExGK2G74
EN4156L**d’**PK1AR	WCN**d**-xGKG74
EN4156L**d’**PK2AR	WCN**d**-xGK2G74
EN4156R**d’**EK1AR	WCN**d**ExKG74
EN4156R**d’**EK2AR	WCN**d**ExK2G74
EN4156R**d’**PK1AR	WCN**d**-xKG74
EN4156R**d’**PK2AR	WCN**d**-xK2G74
EN4156L**d’**EK1BR	WCN**d**ExGKG81
EN4156L**d’**EK2BR	WCN**d**ExGK2G81
EN4156L**d’**PK1BR	WCN**d**-xGKG81
EN4156L**d’**PK2BR	WCN**d**-xGK2G81
EN4156R**d’**EK1BR	WCN**d**ExKG81
EN4156R**d’**EK2BR	WCN**d**ExK2G81
EN4156R**d’**PK1BR	WCN**d**-xKG81
EN4156R**d’**PK2BR	WCN**d**-xK2G81
EN4156L**d’**EK1CR	WCN**d**ExGK
EN4156L**d’**EK2CR	WCN**d**ExGK2
EN4156L**d’**PK1CR	WCN**d**-xGK
EN4156L**d’**PK2CR	WCN**d**-xGK2
EN4156R**d’**EK1CR	WCN**d**ExK
EN4156R**d’**EK2CR	WCN**d**ExK2
EN4156R**d’**PK1CR	WCN**d**-Xk
EN4156R**d’**PK2CR	WCN**d**-xK2
EN4157L**d’**EK1AR	CN**d**ExGK
EN4157L**d’**EK2AR	CN**d**ExGK2
EN4157L**d’**PK1AR	CN**d**-xGK
EN4157L**d’**PK2AR	CN**d**-xGK2
EN4157R**d’**EK1AR	CN**d**ExK
EN4157R**d’**EK2AR	CN**d**ExK2
EN4157R**d’**PK1AR	CN**d**-xK
EN4157R**d’**PK2AR	CN**d**-xK2
EN4157L**d’**EK1BR	CN**d**ExGKG81
EN4157L**d’**EK2BR	CN**d**ExGK2G81
EN4157L**d’**PK1BR	CN**d**-xGKG81
EN4157L**d’**PK2BR	CN**d**-xGK2G81
EN4157R**d’**EK1BR	CN**d**ExKG81
EN4157R**d’**EK2BR	CN**d**ExK2G81
EN4157R**d’**PK1BR	CN**d**-xKG81
EN4157R**d’**PK2BR	CN**d**-xK2G81

Where

d = Bore code

d’ = Incremental number from 01 to 07, 10 to 15 and 20 to 24 in the order of bore codes given pages 47 to 52

Example

EN part number	SKF designation
EN4156L**1**EK1AR	WCN**6,35**E4GKG74
EN4157R**10**PK2BR	CN**7,94**-5K2G81

Inch bearings

AS part number	SKF designation
MS21151-1GE	SREP3ML3SK1
MS21151-1G	REP3ML3SK1
MS21151-1E	SREP3ML3S181
MS21151-1	REP3ML3S181
MS21151-2GE	SREP3MR3SK1
MS21151-2G	REP3MR3SK1
MS21151-2E	SREP3MR3S181
MS21151-2	REP3MR3S181
MS21151-3GE	SREP3M6ASK1
MS21151-3G	REP3M6ASK1
MS21151-3E	SREP3M6AS181
MS21151-3	REP3M6AS181
MS21151-3CGE	SREP3MS6ASK1
MS21151-3CG	REP3MS6ASK1
MS21151-3CE	SREP3MS6AS181
MS21151-3C	REP3MS6AS181
MS21151-4GE	SREP3M6-2NSK1
MS21151-4G	REP3M6-2NSK1
MS21151-4E	SREP3M6-2NS181
MS21151-4	REP3M6-2NS181
MS21151-4CGE	SREP3MS6-2NSK1
MS21151-4CG	REP3MS6-2NSK1
MS21151-4CE	SREP3MS6-2NS181
MS21151-4C	REP3MS6-2NS181
MS21151-5GE	SREP3ML6-2NSK1
MS21151-5G	REP3ML6-2NSK1
MS21151-5E	SREP3ML6-2NS181
MS21151-5	REP3ML6-2NS181
MS21151-5CGE	SREP3MLS6NSK1
MS21151-5CG	REP3MLS6NSK1
MS21151-5CE	SREP3MS6NS181
MS21151-5C	REP3MS6NS181
MS21151-6GE	SRAP3M4-2SK1
MS21151-6G	RAP3M4-2SK1
MS21151-6E	SRAP3M4-2S181
MS21151-6	RAP3M4-2S181
MS21151-6CGE	SRAP3MS4-2SK1
MS21151-6CG	RAP3MS4-2SK1
MS21151-6CE	SRAP3MS4-2S181
MS21151-6C	RAP3MS4-2S181
MS21151-7GE	SREP3M4-6SK1
MS21151-7G	REP3M4-6SK1
MS21151-7E	SREP3M4-6S181
MS21151-7	REP3M4-6S181
MS21151-7CGE	SREP3MS4-6SK1
MS21151-7CG	REP3MS4-6SK1
MS21151-7CE	SREP3MS4-6S181
MS21151-7C	REP3MS4-6S181

AS part number	SKF designation
MS21151-8GE	SREP4M6SK1
MS21151-8G	REP4M6SK1
MS21151-8E	SREP4M6S181
MS21151-8	REP4M6S181
MS21151-8CGE	SREP4M6-4SK1
MS21151-8CG	REP4M6-4SK1
MS21151-8CE	SREP4M6-4S181
MS21151-8C	REP4M6-4S181
MS21151-9GE	SREP4ML6SK1
MS21151-9G	REP4ML6SK1
MS21151-9E	SREP4ML6S181
MS21151-9	REP4ML6S181
MS21151-9CGE	SREP4ML6-4SK1
MS21151-9CG	REP4ML6-4SK1
MS21151-9CE	SREP4ML6-4S181
MS21151-9C	REP4ML6-4S181
MS21151-10GE	SREP5M6SK1
MS21151-10G	REP5M6SK1
MS21151-10E	SREP5M6S181
MS21151-10	REP5M6S181
MS21151-10CGE	SREP5M6-2SK1
MS21151-10CG	REP5M6-2SK1
MS21151-10CE	SREP5M6-2S181
MS21151-10C	REP5M6-2S181
MS21151-11GE	SREP5M7SK1
MS21151-11G	REP5M7SK1
MS21151-11E	SREP5M7S181
MS21151-11	REP5M7S181
MS21151-11CGE	SREP5MS7SK1
MS21151-11CG	REP5MS7K1
MS21151-11CE	SREP5MS7S181
MS21151-11C	REP5MS7S181
MS21151-12GE	SREP5M10SK1
MS21151-12G	REP5M10SK1
MS21151-12E	SREP5M10S181
MS21151-12	REP5M10S181
MS21151-12CGE	SREP5MS10SK1
MS21151-12CG	REP5MS10K1
MS21151-12CE	SREP5MS10S181
MS21151-12C	REP5MS10S181
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	SREPB3NSK1
MS21153-1G	REPB3NSK1
MS21153-1E	SREPB3NS181
MS21153-1	REPB3NS181
MS21153-2GE	SREPB3N-2SK1
MS21153-2G	REPB3N-2SK1
MS21153-2E	SREPB3N-2S181
MS21153-2	REPB3N-2S181
MS21153-3GE	SREP3F4SK1
MS21153-3G	REP3F4SK1
MS21153-3E	SREP3F4S181
MS21153-3	REP3F4S181
MS21153-4GE	SREP3FL4SK1
MS21153-4G	REP3FL4SK1
MS21153-4E	SREP3FL4S181
MS21153-4	REP3FL4S181
MS21153-5GE	SREP3FL4-3SK1
MS21153-5G	REP3FL4-3SK1
MS21153-5E	SREP3FL4-3S181
MS21153-5	REP3FL4-3S181
MS21153-6GE	SREP4F5SK1
MS21153-6G	REP4F5SK1
MS21153-6E	SREP4F5S181
MS21153-6	REP4F5S181
MS21153-6CGE	SREP4F5KSK1
MS21153-6CG	REP4F5KK1
MS21153-6CE	SREP4F5KS181

EN part number	SKF designation
MS21153-6C	REP4F5KS181
MS21153-7GE	SREP4FL5SK1
MS21153-7G	REP4FL5SK1
MS21153-7E	SREP4FL5S181
MS21153-7	REP4FL5S181
MS21153-7CGE	SREP4FL5KSK1
MS21153-7CG	REP4FL5KK1
MS21153-7CE	SREP4FL5KS181
MS21153-7C	REP4FL5KS181
MS21153-8GE	SREP4F7SK1
MS21153-8G	REP4F7SK1
MS21153-8E	SREP4F7S181
MS21153-8	REP4F7S181
MS21153-9GE	SREP4FL7SK1
MS21153-9G	REP4FL7SK1
MS21153-9E	SREP4FL7S181
MS21153-9	REP4FL7S181
MS21153-10GE	SREP5F5SK1
MS21153-10G	REP5F5SK1
MS21153-10E	SREP5F5S181
MS21153-10	REP5F5S181
MS21153-11GE	SREP5FL5SK1
MS21153-11G	REP5FL5SK1
MS21153-11E	SREP5FL5S181
MS21153-11	REP5FL5S181

Self-lubricating spherical plain bearing rod ends

Metric bearings

EN part number		SKF designation
EN2498L**d'**K		EMAJ**d**GRK1)
EN2498L**d'**T		EMAJ**d**GR1)
EN2498R**d'**K		EMAJ**d**RK1)
EN2498R**d'**T		EMAJ**d**R1)
EN4198L**d'**K	EN4198L**d'**KT	XEMAJ**d**GRK1)
EN4198L**d'**G	EN4198L**d'**GT	XEMAJ**d**GR1)
EN4198R**d'**K	EN4198R**d'**KT	XEMAJ**d**RK1)
EN4198R**d'**G	EN4198R**d'**GT	XEMAJ**d**R1)

Where
d = Bore code
d' = 0d for bore code ≤ 8,
d for bore code = 10
1) Except d = 8SP1A

Example

EN part number		SKF designation
EN2498L**08**K	EMAJ**8**GRK	
EN4198R**10**G	EN4198R**10**GT	XEMAJ**10**R

Inch bearings

NSA part number	SKF designation
NSA8143-**d**RK	R**d**MRK
NSA8143-**d**R	R**d**MR
NSA8143-**d**LK	R**d**MLK
NSA8143-**d**L	R**d**ML
NSA 8149-**d**R (Except for **d** = 16)	R**d**FRCS
NSA 8149-**d**L (Except for **d** = 16)	R**d**FLCS
NSA 8149-**16**R	R**16**BFRCS
NSA 8149-**16**L	R**16**BFLCS

Where
d = Bore code

Example

EN part number	SKF designation
NSA8143-**03**RK	R**03**MRK
NSA 8149-**10**L	R**10**FLCS

AS part number	SKF designation
M81935/1-**d**CKL	EMJ/WAS**d**GK
M81935/1-**d**CK	EMJ/WAS**d**K
M81935/1-**d**CL	EMJ/WAS**d**G
M81935/1-**d**C	EMJ/WAS**d**
M81935/1-**d**KL	MJ/WAS**d**GK
M81935/1-**d**K	MJ/WAS**d**K
M81935/1-**d**L	MJ/WAS**d**G
M81935/1-**d**	MJ/WAS**d**

Where
d = Bore code (multiples of 1/16 inch)

Example

AS part number	SKF designation
M81935/1-**03**CKL	EMJ/WAS**03**GK
M81935/1-**10**K	MJ/WAS**10**K

AS part number	AS designation
M81935/6-**d**CKL	EPHMJ/WAS**d**GK
M81935/6-**d**CK	EPHMJ/WAS**d**K
M81935/6-**d**CL	EPHMJ/WAS**d**G
M81935/6-**d**C	EPHMJ/WAS**d**
M81935/6-**d**KL	PHMJ/WAS**d**GK
M81935/6-**d**K	PHMJ/WAS**d**K
M81935/6-**d**L	PHMJ/WAS**d**G
M81935/6-**d**	PHMJ/WAS**d**

Where
d = Bore code (multiples of 1/16 inch)

Example

AS part number	SKF designation
M81935/6-**03**CKL	EPHMJ/WAS**03**GK
M81935/6-**10**K	PHMJ/WAS**10**K

AS part number	SKF designation
M81935/8-**d**CKL	EPHMJ/NAS**d**GK
M81935/8-**d**CK	EPHMJ/NAS**d**K
M81935/8-**d**CL	EPHMJ/NAS**d**G
M81935/8-**d**C	EPHMJ/NASd
M81935/8-**d**KL	PHMJ/NAS**d**GK
M81935/8-**d**K	PHMJ/NAS**d**K
M81935/8-**d**L	PHMJ/NAS**d**G
M81935/8-**d**	PHMJ/NAS**d**

Where
d = Bore code (multiples of 1/16 inch)

Example

AS part number	SKF designation
M81935/8-**03**CKL	EPHMJ/NAS**03**GK
M81935/8-**10**K	PHMJ/NAS**10**K

AS part number	SKF designation
M81935/4-**d**CKL	EMJ/NAS**d**GK
M81935/4-**d**CK	EMJ/NAS**d**K
M81935/4-**d**CL	EMJ/NAS**d**G
M81935/4-**d**C	EMJ/NAS**d**
M81935/4-**d**KL	MJ/NAS**d**GK
M81935/4-**d**K	MJ/NAS**d**K
M81935/4-**d**L	MJ/NAS**d**G
M81935/4-**d**	MJ/NAS**d**

Where
d = Bore code (multiples of 1/16 inch)

Example

AS part number	SKF designation
M81935/4-**03**CKL	EMJ/NAS**03**GK
M81935/4-**10**K	MJ/NAS**10**K

AS part number	SKF designation
M81935/2-**d**CKL	EFJ/WAS**d**GK
M81935/2-**d**CK	EFJ/WAS**d**K
M81935/2-**d**CWL	EFJ/WAS**d**GW
M81935/2-**d**CW	EFJ/WAS**d**W
M81935/2-**d**CL	EFJ/WAS**d**G
M81935/2-**d**C	EFJ/WAS**d**
M81935/2-**d**KL	FJ/WAS**d**GK
M81935/2-**d**K	FJ/WAS**d**K
M81935/2-**d**WL	FJ/WAS**d**GW
M81935/2-**d**W	FJ/WAS**d**W
M81935/2-**d**L	FJ/WAS**d**G
M81935/2-**d**	FJ/WAS**d**

Where
d = Bore code (multiples of 1/16 inch)

Example

AS part number	SKF designation
M81935/2-**03**CKL	EFJ/WAS**03**GK
M81935/2-**10**W	FJ/WAS**10**W

NSA part number	SKF designation
M81935/7-**d**CKL	EPHFJ/WAS**d**GK
M81935/7-**d**CK	EPHFJ/WAS**d**K
M81935/7-**d**CWL	EPHFJ/WAS**d**GW
M81935/7-**d**CW	EPHFJ/WAS**d**W
M81935/7-**d**CL	EPHFJ/WAS**d**G
M81935/7-**d**C	EPHFJ/WAS**d**
M81935/7-**d**KL	PHFJ/WAS**d**GK
M81935/7-**d**K	PHFJ/WAS**d**K
M81935/7-**d**WL	PHFJ/WAS**d**GW
M81935/7-**d**W	PHFJ/WAS**d**W
M81935/7-**d**L	PHFJ/WAS**d**G
M81935/7-**d**	PHFJ/WAS**d**

Where
d = Bore code (multiples of 1/16 inch)

Example

AS part number	SKF designation
M81935/7-**03**CKL	EPHFJ/WAS**03**GK
M81935/7-**10**W	PHFJ/WAS**10**W

NSA part number	SKF designation
M81935/9-**d**CKL	EPHFJ/NAS**d**GK
M81935/9-**d**CK	EPHFJ/NAS**d**K
M81935/9-**d**CWL	EPHFJ/NAS**d**GW
M81935/9-**d**CW	EPHFJ/NAS**d**W
M81935/9-**d**CL	EPHFJ/NAS**d**G
M81935/9-**d**C	EPHFJ/NAS**d**
M81935/9-**d**KL	PHFJ/NAS**d**GK
M81935/9-**d**K	PHFJ/NAS**d**K
M81935/9-**d**WL	PHFJ/NAS**d**GW
M81935/9-**d**W	PHFJ/NAS**d**W
M81935/9-**d**L	PHFJ/NAS**d**G
M81935/9-**d**	PHFJ/NAS**d**

Where
d = Bore code (multiples of 1/16 inch)

Example

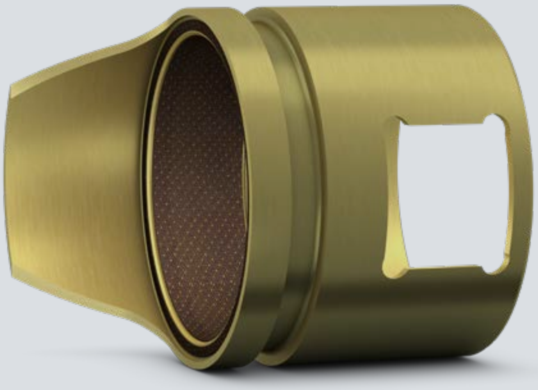
AS part number	SKF designation
M81935/9-**03**CKL	EPHFJ/NAS**03**GK
M81935/9-**10**W	PHFJ/NAS**10**W

AS part number	SKF designation
M81935/5-**d**CKL	EFJ/NAS**d**GK
M81935/5-**d**CK	EFJ/NAS**d**K
M81935/5-**d**CWL	EFJ/NAS**d**GW
M81935/5-**d**CW	EFJ/NAS**d**W
M81935/5-**d**CL	EFJ/NAS**d**G
M81935/5-**d**C	EFJ/NAS**d**
M81935/5-**d**KL	FJ/NAS**d**GK
M81935/5-**d**K	FJ/NAS**d**K
M81935/5-**d**WL	FJ/NAS**d**GW
M81935/5-**d**W	FJ/NAS**d**W
M81935/5-**d**L	FJ/NAS**d**G
M81935/5-**d**	FJ/NAS**d**

Where
d = Bore code (multiples of 1/16 inch)

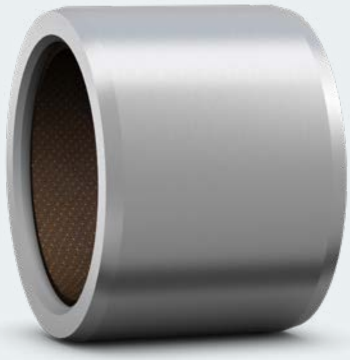
Example

AS part number	SKF designation
M81935/5-**03**CKL	EFJ/NAS**03**GK
M81935/5-**10**W	FJ/NAS**10**W



4

Self-lubricating journal bearings



4 Self-lubricating journal bearings

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.

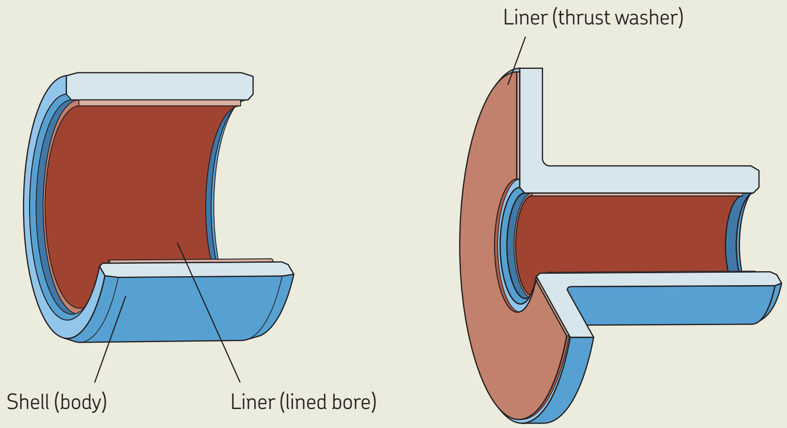
Shell materials

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.

Airframe journal bearings



Plain bearings

Flanged bearings

For more information and options, refer to *Shell* **page 391**.

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 391**.

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 391**.

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 393**.

Contact your regional SKF Aerospace partner at: skf.com/go/aero

Table 1

SKF self-lubricating journal bearings, metric dimensions

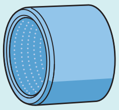
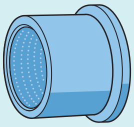
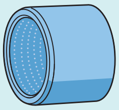
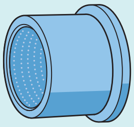
Shape	Shell material	Reference standard	Liner	SKF series	Product table	Page
Plain	Corrosion-resistant steel	EN 2287	X1	13C..Z	4.1	394
		EN 2287	Fiberslip	..K	4.1	394
		–	X1	13D..Z	4.2	396
	Aluminium alloy	EN 2285	X1	13C..Z	4.1	394
		EN 2285	Fiberslip	..K	4.1	394
		–	X1	13D..Z	4.2	396
Flanged	Corrosion-resistant steel	EN 2288	X1	13C..F	4.3	398
		EN 2288	Fiberslip	..F..K	4.3	398
		–	X1	13D..F	4.4	400
	Aluminium alloy	EN 2286	X1	13C..F	4.3	398
		EN 2286	Fiberslip	..F..K	4.3	398
		–	X1	13D..F	4.4	400

Table 2

SKF self-lubricating journal bearings, inch dimensions

Shape	Shell material	Reference standard	Liner	SKF series	Product table	Page
Plain	Corrosion-resistant steel	NSA 8145	X1	13A..Z..	4.5	402
		NSA 8145	Fiberslip	K..P	4.5	402
		AS 81934/1	X1	13B..Z..	4.6	404
		EN 4536-2	X1	13E..Z..	4.7	406
	Aluminium alloy	NSA 8146	X1	13A..Z..	4.5	402
		NSA 8146	Fiberslip	K..P	4.5	402
		AS 81934/1	X1	13B..Z..	4.6	404
		EN 4534-2	X1	13E..Z..	4.7	406
Flanged	Corrosion-resistant steel	NSA 8147	X1	13A..Z..	4.8	408
		NSA 8147	Fiberslip	K..F..P	4.8	408
		AS 81934/2	X1	13B..F..	4.9	410
		EN 4537-2	X1	13E..F..	4.10	412
	Aluminium alloy	NSA 8148	X1	13A..F..	4.8	408
		NSA 8148	Fiberslip	K..F..P	4.8	408
		AS 81934/2	X1	13B..F..	4.9	410
		EN 4535-2	X1	13E..F..	4.10	412

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:

1 Determine the range of allowable interface 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 384**.

2 From the product tables (**pages 394** to **415**), 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 391**),and refer to fits and counterface recommendations (**page 386**).

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 393**.

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 134**. For operating conditions beyond the tested parameters, contact your regional SKF Aerospace partner at : 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 ≥ 10 cpm
- wear ≤ 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 134**.

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

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 136**.

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 391**
- 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 137**.

Table 3

Static load limits and dynamic load ratings, metric values

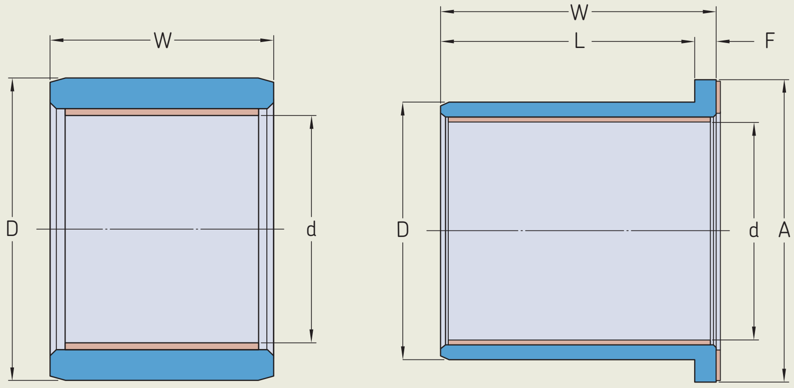
mm, N and MPa	Radial static load limit	Axial static load limit	Radial dynamic load rating
Plain	$C_s = \frac{3}{4} \sigma_{yield}\, d\, (W - 2,5)$	–	$C = 260\, d\, (W - 2,5)$
Flanged	$C_s = \frac{3}{4} \sigma_{yield}\, d\, (L - 1,75)$	$C_a = 0,47\, \sigma_{yield}\, ((A - 1,5)^2 - (d + 2,5)^2)$	$C = 260\, d\, (L - 1,75)$

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
Plain	$C_s = \frac{3}{4} \sigma_{yield}\, d\, (W - 0,1)$	–	$C = 37\,500\, d\, (W - 0,1)$
Flanged	$C_s = \frac{3}{4} \sigma_{yield}\, d\, (L - 0,07)$	$C_a = 0,47\, \sigma_{yield}\, ((A - 0,06)^2 - (d + 0,1)^2)$	$C = 37\,500\, d\, (L - 0,07)$

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*]
σ_{yield} = Yield stress of shell material [MPa/*psi*] (**table 5**)

Table 5

Yield stresses of shell material

Material	Yield stress σ_{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 387** to **390**.

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 ≤ 0,1 µm *(4 µin.)*
- Hardness ≥ 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 393** 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**			
			Transition fit		Loose fit					Transition fit		Loose fit	
	Upper	Lower	Upper	Lower	Upper	Lower		Upper	Lower	Upper	Lower	Upper	Lower
–	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		Housing diameter		Shaft diameter			
Code	Size			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	0.2496	0.2495	0.2491
	6,350	9,535	9,525	6,350	6,340	6,337	6,327
05	5/16	0.4380	0.4375	0.3125	0.3121	0.3120	0.3116
	7,938	11,125	11,113	7,938	7,927	7,925	7,915
06	3/8	0.5005	0.5000	0.3750	0.3746	0.3745	0.3741
	9,525	12,713	12,700	9,525	9,515	9,512	9,502
08	1/2	0.6882	0.6875	0.5000	0.4996	0.4994	0.4990
	12,700	17,480	17,463	12,700	12,690	12,685	12,675
10	5/8	0.8133	0.8125	0.6250	0.6246	0.6244	0.6240
	15,875	20,658	20,638	15,875	15,865	15,860	15,850
12	3/4	0.9383	0.9375	0.7500	0.7495	0.7492	0.7487
	19,050	23,833	23,813	19,050	19,037	19,030	19,017
14	7/8	1.0633	1.0625	0.8750	0.8745	0.8742	0.8737
	19,050	27,008	26,988	22,225	22,212	22,205	22,192
16	1	1.1883	1.1875	1.0000	0.9995	0.9992	0.9987
	25,400	30,183	30,163	25,400	25,387	25,380	25,367
18	1 1/8	1.3135	1.3125	1.1250	1.1245	1.1242	1.1237
	28,575	33,363	33,338	28,575	28,562	28,555	28,542
20	1 1/4	1.5010	1.5000	1.2500	1.2494	1.2490	1.2484
	31,750	38,125	38,100	31,750	31,735	31,725	31,709
22	1 3/8	1.6260	1.6250	1.3750	1.3744	1.3740	1.3734
	34,925	41,300	41,275	34,925	34,910	34,900	34,884
24	1 1/2	1.7510	1.7500	1.5000	1.4994	1.4990	1.4984
	38,100	44,475	44,450	38,100	38,085	38,075	38,059
28	1 3/4	2.0012	2.0000	1.7500	1.7494	1.7490	1.7484
	44,450	50,830	50,800	44,450	44,435	44,425	44,409
32	2	2.2512	2.2500	2.0000	1.9993	1.9988	1.9981
	50,800	57,180	57,150	50,800	50,782	50,770	50,752

Adhesive bonding to housing

Nominal bore	Housing diameter		Shaft diameter			
Code			Transition fit		Loose fit	
	Upper	Lower	Upper	Lower	Upper	Lower
–	in/mm		in/mm			
04	0.3800	0.3780	0.2511	0.2507	0.2503	0.2499
	9,652	9,601	6,378	6,368	6,358	6,347
05	0.4426	0.4406	0.3138	0.3134	0.3130	0.3126
	11,242	11,191	7,971	7,960	7,950	7,940
06	0.5051	0.5031	0.3764	0.3760	0.3756	0.3752
	12,830	12,779	9,561	9,550	9,540	9,530
08	0.6928	0.6908	0.5014	0.5010	0.5006	0.5002
	17,597	17,546	12,736	12,725	12,715	12,705
10	0.8179	0.8159	0.6265	0.6261	0.6257	0.6253
	20,775	20,724	15,913	15,903	15,893	15,883
12	0.9429	0.9409	0.7516	0.7511	0.7508	0.7503
	23,950	23,899	19,091	19,078	19,070	19,058
14	1.0680	1.0660	0.8767	0.8762	0.8759	0.8754
	27,127	27,076	22,268	22,255	22,248	22,235
16	1.1930	1.1910	1.0018	1.0013	1.0010	1.0005
	30,302	30,251	25,446	25,433	25,425	25,413
18	1.3183	1.3163	1.1271	1.1266	1.1263	1.1258
	33,485	33,434	28,628	28,616	28,608	28,595
20	1.5059	1.5039	1.2520	1.2514	1.2512	1.2506
	38,250	38,199	31,801	31,786	31,780	31,765
22	1.6309	1.6289	1.3771	1.3765	1.3763	1.3757
	41,425	41,374	34,978	34,963	34,958	34,943
24	1.7539	1.7519	1.5021	1.5015	1.5013	1.5007
	44,549	44,498	38,153	38,138	38,133	38,118
28	2.0063	2.0043	1.7525	1.7519	1.7517	1.7511
	50,960	50,909	44,514	44,498	44,493	44,478
32	2.2563	2.2543	2.0025	2.0018	2.0017	2.0010
	57,310	57,259	50,864	50,846	50,843	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

Nominal bore		Housing diameter		Shaft diameter			
Code	Size			Transition fit		Loose fit	
		Upper	Lower	Upper	Lower	Upper	Lower
–	in/mm	in/mm		in/mm			
04	1/4	0.3754	0.3750	0.2495	0.2490	0.2489	0.2484
	6,350	9,535	9,525	6,337	6,325	6,322	6,309
05	5/16	0.4380	0.4375	0.3120	0.3115	0.3114	0.3109
	7,938	11,125	11,113	7,925	7,912	7,910	7,897
06	3/8	0.5005	0.5000	0.3745	0.3740	0.3739	0.3734
	9,525	12,713	12,700	9,512	9,500	9,497	9,484
07	7/16	0.5631	0.5624	0.4365	0.4360	0.4358	0.4353
	11,113	14,303	14,285	11,087	11,074	11,069	11,057
08	1/2	0.6258	0.6251	0.4990	0.4985	0.4983	0.4978
	12,700	15,895	15,878	12,675	12,662	12,657	12,644
09	9/16	0.6885	0.6878	0.5615	0.5610	0.5608	0.5603
	14,288	17,488	17,470	14,262	14,249	14,244	14,232
10	5/8	0.8135	0.8127	0.6240	0.6235	0.6233	0.6228
	15,875	20,663	20,643	15,850	15,837	15,832	15,819
11	1 1/16	0.8760	0.8752	0.6865	0.6860	0.6858	0.6853
	26,988	22,250	22,230	17,437	17,424	17,419	17,407
12	3/4	0.9386	0.9378	0.7490	0.7485	0.7482	0.7478
	19,050	23,840	23,820	19,025	19,012	19,004	18,994
14	7/8	1.0638	1.0630	0.8740	0.8735	0.8732	0.8727
	22,225	27,021	27,000	22,200	22,187	22,179	22,167
16	1	1.1891	1.1883	0.9990	0.9985	0.9982	0.9978
	25,400	30,203	30,183	25,375	25,362	25,354	25,344
18	1 1/8	1.3141	1.3131	1.1240	1.1235	1.1232	1.1227
	28,575	33,378	33,353	28,550	28,537	28,529	28,517
20	1 1/4	1.4390	1.4380	1.2490	1.2484	1.2480	1.2474
	31,750	36,551	36,525	31,725	31,709	31,699	31,684
22	1 3/8	1.5640	1.5630	1.3740	1.3734	1.3730	1.3724
	34,925	39,726	39,700	34,900	34,884	34,874	34,859
24	1 1/2	1.7515	1.7505	1.4990	1.4984	1.4980	1.4974
	38,100	44,488	44,463	38,075	38,059	38,049	38,034
26	1 5/8	1.8765	1.8755	1.6240	1.6234	1.6230	1.6224
	41,275	47,663	47,638	41,250	41,234	41,224	41,209
28	1 3/4	2.0014	2.0002	1.7480	1.7474	1.7480	1.7474
	44,450	50,836	50,805	44,399	44,384	44,399	44,384
32	2	2.2514	2.2502	1.9990	1.9983	1.9978	1.9971
	50,800	57,186	57,155	50,775	50,757	50,744	50,726

Adhesive bonding to housing

Nominal bore	Housing diameter		Shaft diameter			
Code			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	1.1263	1.1258	1.1255	1.1250
	33,500	33,449	28,608	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

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								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	0.2500	0.2495	0.2494	0.2489	04	0.3800	0.3780	0.2513	0.2508	0.2505	0.2500
	6,350	9,535	9,525	6,350	6,337	6,335	6,322		9,652	9,601	6,383	6,370	6,363	6,350
05	5/16	0.4380	0.4375	0.3125	0.3120	0.3119	0.3114	05	0.4426	0.4406	0.3138	0.3133	0.3130	0.3125
	7,938	11,125	11,113	7,938	7,925	7,922	7,910		11,242	11,191	7,971	7,958	7,950	7,938
06	3/8	0.5005	0.5000	0.3750	0.3745	0.3744	0.3739	06	0.5051	0.5031	0.3763	0.3758	0.3755	0.3750
	9,525	12,713	12,700	9,525	9,512	9,510	9,497		12,830	12,779	9,558	9,545	9,538	9,525
07	7/16	0.5631	0.5624	0.4370	0.4365	0.4363	0.4358	07	0.5677	0.5657	0.4388	0.4383	0.4380	0.4375
	11,113	14,303	14,285	11,100	11,087	11,082	11,069		14,420	14,369	11,146	11,133	11,125	11,113
08	1/2	0.6258	0.6251	0.4995	0.4990	0.4988	0.4983	08	0.6305	0.6285	0.5013	0.5008	0.5005	0.5000
	12,700	15,895	15,878	12,687	12,675	12,670	12,657		16,015	15,964	12,733	12,720	12,713	12,700
09	9/16	0.6885	0.6878	0.5620	0.5615	0.5613	0.5608	09	0.6932	0.6912	0.5638	0.5633	0.5630	0.5625
	14,288	17,488	17,470	14,275	14,262	14,257	14,244		17,607	17,556	14,321	14,308	14,300	14,288
10	5/8	0.8135	0.8127	0.6245	0.6240	0.6238	0.6233	10	0.8181	0.8161	0.6263	0.6258	0.6255	0.6250
	15,875	20,663	20,643	15,862	15,850	15,845	15,832		20,780	20,729	15,908	15,895	15,888	15,875
11	11/16	0.8760	0.8752	0.6870	0.6865	0.6863	0.6858	11	0.8806	0.8786	0.6888	0.6883	0.6880	0.6875
	26,988	22,250	22,230	17,450	17,437	17,432	17,419		22,367	22,316	17,496	17,483	17,475	17,463
12	3/4	0.9386	0.9378	0.7495	0.7490	0.7487	0.7482	12	0.9432	0.9412	0.7513	0.7508	0.7505	0.7500
	19,050	23,840	23,820	19,037	19,025	19,017	19,004		23,957	23,906	19,083	19,070	19,063	19,050
14	7/8	1.0638	1.0630	0.8745	0.8740	0.8737	0.8732	14	1.0684	1.0664	0.8763	0.8758	0.8755	0.8750
	22,225	27,021	27,000	22,212	22,200	22,192	22,179		27,137	27,087	22,258	22,245	22,238	22,225
16	1	1.1891	1.1883	0.9995	0.9990	0.9987	0.9982	16	1.1938	1.1918	1.0013	1.0008	1.0005	1.0000
	25,400	30,203	30,183	25,387	25,375	25,367	25,354		30,323	30,272	25,433	25,420	25,413	25,400
18	11/8	1.3141	1.3131	1.1245	1.1240	1.1237	1.1232	18	1.3189	1.3169	1.1265	1.1258	1.1255	1.1250
	28,575	33,378	33,353	28,562	28,550	28,542	28,529		33,500	33,449	28,613	28,595	28,588	28,575
20	1 1/4	1.4390	1.4380	1.2495	1.2489	1.2485	1.2479	20	1.4440	1.4420	1.2513	1.2507	1.2505	1.2499
	31,750	36,551	36,525	31,737	31,722	31,712	31,697		36,678	36,627	31,783	31,768	31,763	31,747
22	13/8	1.5640	1.5630	1.3745	1.3739	1.3735	1.3729	22	1.5699	1.5679	1.3763	1.3757	1.3755	1.3749
	34,925	39,726	39,700	34,912	34,897	34,887	34,872		39,875	39,825	34,958	34,943	34,938	34,922
24	1 1/2	1.7515	1.7505	1.4995	1.4989	1.4985	1.4979	24	1.7544	1.7524	1.5013	1.5007	1.5005	1.4999
	38,100	44,488	44,463	38,087	38,072	38,062	38,047		44,562	44,511	38,133	38,118	38,113	38,097
26	15/8	1.8765	1.8755	1.6245	1.6239	1.6235	1.6229	26	1.8818	1.8798	1.6263	1.6257	1.6255	1.6249
	41,275	47,663	47,638	41,262	41,247	41,237	41,222		47,798	47,747	41,308	41,293	41,288	41,272
28	1 3/4	2.0014	2.0002	1.7495	1.7489	1.7485	1.7479	28	2.0065	2.0045	1.7513	1.7506	1.7505	1.7499
	44,450	50,836	50,805	44,437	44,422	44,412	44,397		50,965	50,914	44,483	44,465	44,463	44,447
32	2	2.2514	2.2502	1.9995	1.9988	1.9983	1.9976	32	2.2565	2.2545	2.0013	2.0006	2.0005	1.9998
	50,800	57,186	57,155	50,787	50,770	50,757	50,739		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 138**.

For detailed information about customized liners such as Textilub, contact your regional SKF Aerospace partner at: 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

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	• enhanced corrosion resistance
	Cadmium[1] plating	AMS03-19[2] AMS-QQ-P-416	• enhanced corrosion resistance • galvanic corrosion resistance • fretting resistance
	Zinc-nickel plating	AMS2417	• enhanced corrosion resistance • galvanic corrosion resistance • fretting resistance
Aluminium alloy	Sulfuric acid anodizing	AMS03-25[1][3] MIL-A-8625	• corrosion resistance

---

[1] Treatment includes chromium 6 compounds and may be subject to environmental legislation.
[2] Formerly DEF STAN 03-19
[3] 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.

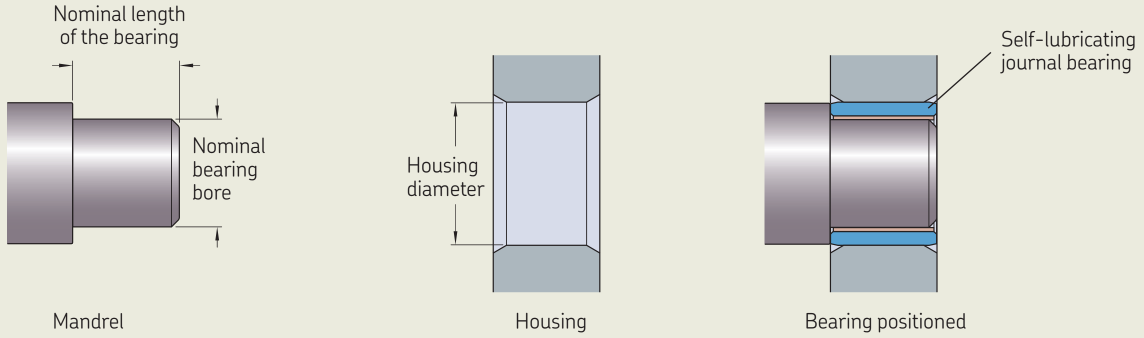
Storage

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.

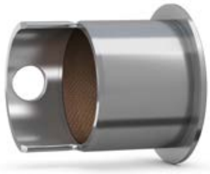
Figure 1

Bearing mounting



Customized products

SKF designs and manufactures customized journal bearings to meet customer-specific application requirements. Some examples:








General customizations are listed in **table 11**

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

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

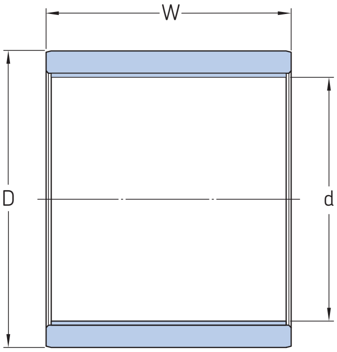
Certain treatments include chromium 6 compounds and may be subject to environmental legislation.

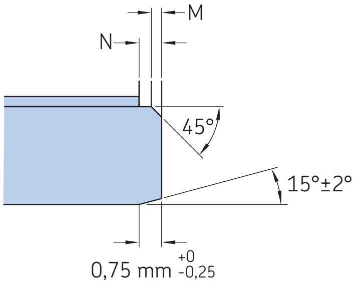
Specific customization

- **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

Nominal bore code	M	N
–	mm	
≤ 18	max. 0,2	max. 0,25
≥ 20	max. 0,2	max. 0,5

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		Y1
	13C3025SZC	13C	30	25	S		Z	C	
	1008AKY2		10	08	A	K			Y2

Basic designation

Bore code

...	Two digits, bore diameter [mm]

Length code

...	Two digits, length [mm]

Material

S	Corrosion-resistant steel (CRES)
A1)	Aluminium alloy 2618
AA	Aluminium alloy 2024

Surface treatment

No code	Not plated CRES or anodized aluminium
C1)	Cadmium plated on CRES
J1)	Zinc-nickel plated on CRES

Oversize

No code	Standard outer diameter size
Y11)	0,1 mm oversized outer diameter
Y21)	0,2 mm oversized outer diameter

1) SKF option

More specifications

More options and sizes available than the standards offers, see1).

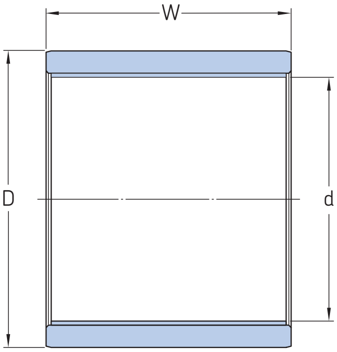
Customized journal bearings

Contact SKF at skf.com/go/aero

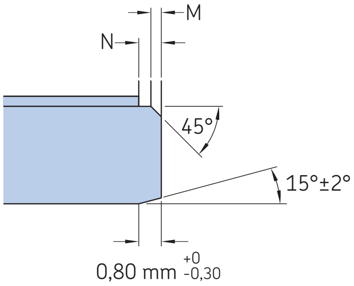
Length –0,1/–0,4											**Masses**	
W											CRES	Aluminium alloy
20	22	25	28	30	32	35	40	45	50		Per mm length (W)	Per mm length (W)
mm											g	
											0,39	0,15
											0,48	0,18
											0,58	0,22
											0,68	0,26
											0,82	0,31
											0,87	0,32
											0,97	0,37
🟩											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 $^{0}_{-0,32}$	max. 0,60

Nominal bore Code	**Dimensions**				**Length** –0,1/–0,4						
	d		D		W						
	Upper	Lower	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		
	13D1215SZCY1	13D	12	15	S	Z	C	Y1

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	Not plated CRES or anodized 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

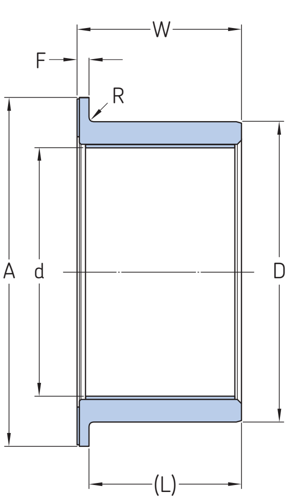
Customized journal bearings

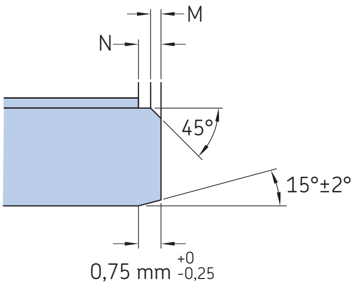
Contact SKF at skf.com/go/aero

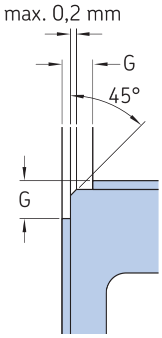
Length –0,1/–0,4 W									**Masses** CRES Per mm length (W)	 Aluminium alloy Per mm length (W)
22	25	28	30	35	40	45	50			
mm									g	
									0,44	0,18
									0,55	0,22
									0,66	0,26
									0,77	0,31
									0,92	0,37
●	●								0,98	0,40
●	●								1,09	0,44
●	●	●	●						1,41	0,56
●	●	●	●						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, EN 2286 and EN 2288, 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. 0,2	max. 0,25	$0{,}4^{0}_{-0{,}3}$	$0.90^{0}_{-0.25}$
12 to 18	max. 0,2	max. 0,25	$0{,}75^{0}_{-0{,}25}$	$0.90^{0}_{-0.25}$
≥ 20	max. 0,2	max. 0,50	$0{,}75^{0}_{-0{,}25}$	$1.20^{0}_{-0.25}$

Nominal bore Code	Dimensions						Length –0,1/–0,4						
	d		D		F	A	W						
	Upper	Lower	Upper	Lower	0/–0,15	0/–0,25							
							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			C	
	3220FAKY2		32	20		F	A	K		Y2

Basic designation

Bore code

...	Two digits, bore diameter [mm]

Length code

...	Two digits, length [mm]

Material

S	Corrosion-resistant steel (CRES)
A1)	Aluminium alloy 2618
AA	Aluminium alloy 2024

Surface treatment

No code	Not plated CRES or anodized aluminium
C1)	Cadmium plated on CRES
J1)	Zinc-nickel plated on CRES

Oversize

No code	Standard outer diameter size
Y11)	0,1 mm oversized outer diameter
Y21)	0,2 mm oversized outer diameter

1) 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, see1).

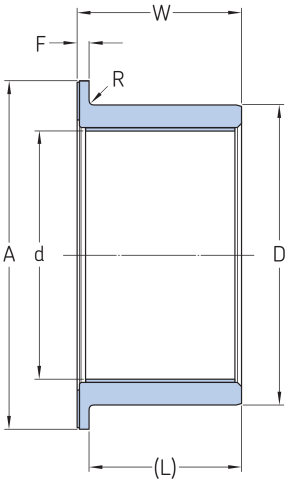
Customized journal bearings

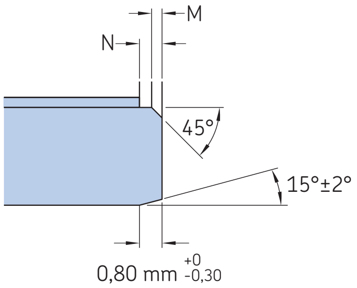
Contact SKF at skf.com/go/aero

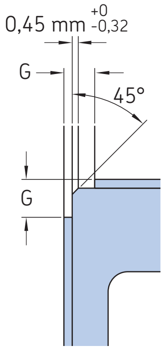
Length –0,1/–0,4											**Masses**			
W											CRES		Aluminium alloy	
20	22	25	28	30	32	35	40	45	50		Per mm length (L)	Flange	Per mm length (L)	Flange
mm											g			
											0,46	0,44	0,18	0,18
											0,55	0,55	0,21	0,22
											0,65	0,66	0,24	0,26
											0,91	0,77	0,35	0,31
											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: 17-4PH

Surface treatment: Passivated

Aluminium alloy: 2024

Surface treatment: Sulfuric acid anodized

Liner: X1

M	N	R	G
mm			
$0,45_{-0,32}^{0}$	max. 0,60	$0,80_{-0,30}^{0}$	$1,0_{-0,5}^{0}$

Nominal bore Code	Dimensions d Upper	Lower	D Upper	Lower	F 0/–0,15	A 0/–0,25	Length –0,1/–0,4 W 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

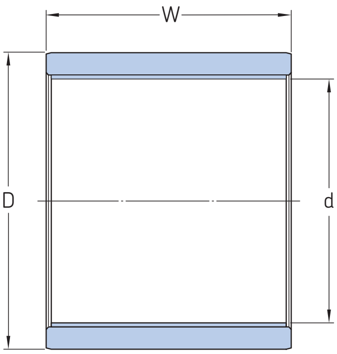
Customized journal bearings

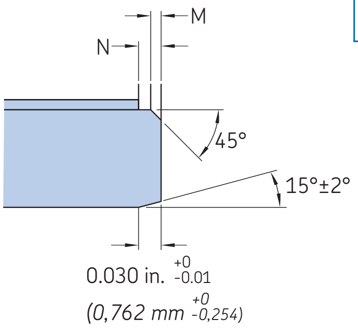
Contact SKF at skf.com/go/aero

Length –0,1/–0,4 W										**Masses** CRES Per mm length (L)	Flange	Aluminium alloy Per mm 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, NSA 8145, NSA 8146, inch dimensions

13A..Z.., K..P





Technical specification	AS 8943
Product standard	NSA 8145 (Corrosion-resistant steel) NSA 8146 (Aluminium alloy)
Standard materials	
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 *max. 0,254*	max. 0.025 *max. 0,635*
≥ 14	max. 0.020 *max. 0,508*	max. 0.025 *max. 0,635*

Nominal bore		**Dimensions**				**Length (W)** –0.005/–0.015 *(–0,127/–0,381)*						
		d		D		5/32	3/16	1/4	5/16	3/8	7/16	1/2
Dia-meter	Code	Upper	Lower	Upper	Lower	*3,968* 02[3]	*4,7625* 03	*6,35* 04	*7,935* 05	*9,525* 06	*11,115* 07	*12,7* 08
in		in/*mm*				in/*mm*						
1/4	04	0.2512 *6,401*	0.2503 *6,358*	0.3760 *9,550*	0.3755 *9,538*	■	■	■	■	■		
5/16	05	0.3139 *7,973*	0.3130 *7,950*	0.4386 *11,140*	0.4381 *11,128*	■	■	■	■	■	■ 2)	■
3/8	06	0.3765 *9,563*	0.3756 *9,540*	0.5011 *12,728*	0.5006 *12,715*		■	■	■	■	■ 2)	■
7/16	07	0,4405 *11,188*	0,4395 *11,164*	0,6269 *15,924*	0,6260 *15,900*		■	■	■	■	■ 2)	■
1/2	08	0.5016 *12,741*	0.5006 *12,715*	0.6888 *17,496*	0.6883 *17,483*		■	■	■	■	■ 2)	■
5/8	10	0.6267 *15,918*	0.6257 *15,893*	0.8139 *20,673*	0.8134 *20,660*			■	■	■	■ 2)	■
3/4	12	0.7520 *19,101*	0.7508 *19,070*	0.9389 *23,848*	0.9384 *23,835*			■	■	■	■ 2)	■
7/8	14	0.8771 *22,278*	0.8759 *22,248*	1.0640 *27,026*	1.0635 *27,013*			■	■	■	■ 2)	■
1	16	1.0022 *25,456*	1.0010 *25,425*	1.1890 *30,201*	1.1885 *30,188*			■	■	■	■ 2)	■
1 1/8	18	1.1275 *28,639*	1.1263 *28,608*	1.3143 *33,383*	1.3137 *33,368*				■ 1)	■	■ 2)	■
1 1/4	20	1.2528 *31,821*	1.2512 *31,780*	1.5019 *38,148*	1.5013 *38,133*				■ 1)	■	■ 2)	■
1 3/8	22	1.3779 *34,999*	1.3763 *34,958*	1.6269 *41,323*	1.6263 *41,308*				■ 1)	■	■ 2)	■
1 1/2	24	1.5029 *38,174*	1.5013 *38,133*	1.7519 *44,498*	1.7513 *44,483*				■ 1)	■	■ 2)	■
1 3/4	28	1.7533 *44,534*	1.7517 *44,493*	2.0023 *50,858*	2.0016 *50,841*					■ 1)	■ 2)	■
2	32	2.0035 *50,889*	2.0017 *50,843*	2.2523 *57,208*	2.2516 *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	13A	A	Z	04	03			Y1
	13ASZ1012C	13A	S	Z	10	12		C	
	KA0403PY2	K	A		04	03	P		Y2

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
C1)	Cadmium plated on CRES
J1)	Zinc-nickel plated on CRES

Oversize

No code	Standard outer diameter size
Y11)	0.005 in oversized outer diameter
Y21)	0.010 in oversized outer diameter

1) SKF option

More specifications

More options and sizes available than the standards offers, see 1) and 2).

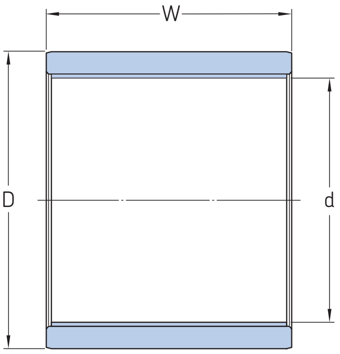
Customized journal bearings

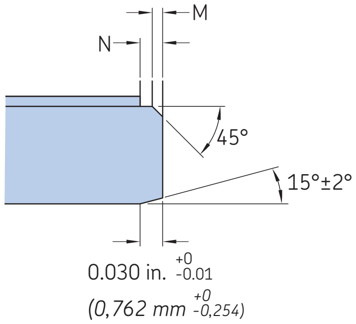
Contact SKF at skf.com/go/aero

Length (W) –0.005/–0.015 *(–0,127/–0,381)*										**Masses**	
5/8	3/4	7/8	1	1 1/4	1 1/2	2	2 1/2	3		CRES	Aluminium alloy
15,88	*19,05*	*22,23*	*25,5*	*31,75*	*38,1*	*50,8*	*63,5*	*76,2*		Per inch length (W)	Per inch length (W)
10	**12**	**14**	**16**	**20**	**24**	**32**	**40**	**48**			
in/*mm*										lb/*g*	
										0.012 *5,443*	0.007 *3,175*
										0.020 *9,072*	0.008 *3,629*
■										0.024 *10,886*	0.009 *4,082*
■										0.044 *20,063*	0.015 *6,804*
■	■									0.050 *22,680*	0.019 *8,618*
■	■	2)	■							0.060 *27,216*	0.023 *10,433*
■	■	2)	■	■						0.070 *31,751*	0.027 *12,247*
■	■	2)	■	■						0.075 *34,019*	0.030 *13,608*
■	■	2)	■	■	■					0.084 *38,102*	0.034 *15,422*
■	■	2)	■	■	■					0.093 *42,184*	0.038 *17,236*
■	■	2)	■	■	■	■				0.146 *66,224*	0.058 *26,308*
■	■	2)	■	■	■	■				0.160 *72,575*	0.063 *28,576*
■	■	2)	■	■	■	■	■			0.173 *78,471*	0.068 *30,844*
■	■	2)	■	■	■	■	■	■		0.200 *90,718*	0.078 *35,380*
■	■	2)	■	■	■	■	■	■		0.225 *102,058*	0.089 *40,370*

4.6 Plain bearings, AS 81934/1, 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	N	N
–	in/*mm*	
≤ 12	max. 0.005 *max. 0,127*	max. 0.010 *max. 0,254*
≥ 14	max. 0.015 *max. 0,381*	max. 0.025 *max. 0,635*

Nominal bore		Dimensions		Length (W) 0/–0.01 *0/–0,254*												
Diameter	Code	d 0/–0.0010 *0/–0,0254*	D CRES 0/–0.0005 *(0/–0,013)* Aluminium alloy ±0.0005 *(±0.013)*	5/32 *3,97* 05	3/16 *4,76* 06	7/32 *5,56* 07	1/4 *6,35* 08	9/32 *7,14* 09	5/16 *7,94* 10	11/32 *8,73* 11	3/8 *9,53* 12	7/16 *11,11* 14	1/2 *12,7* 16	9/16 *14,29* 18	5/8 *15,88* 20	11/16 *17,46* 22
in		in/*mm*		in/*mm*												
1/4	04	0.2515 *6,388*	0.3760 *9,550*	■	■	■	■	■	■	■	■	■				
5/16	05	0.3140 *7,976*	0.4386 *11,140*	■	■	■	■	■	■	■	■	■	■	■		
3/8	06	0.3765 *9,563*	0.5012 *12,730*	■	■	■	■	■	■	■	■	■	■	■	■	■
7/16	07	0.4390 *11,151*	0.5638 *14,321*	■	■	■	■	■	■	■	■	■	■	■	■	■
1/2	08	0.5015 *12,738*	0.6265 *15,913*	■	■	■	■	■	■	■	■	■	■	■	■	■
9/16	09	0.5640 *14,326*	0.6892 *17,506*	■	■	■	■	■	■	■	■	■	■	■	■	■
5/8	10	0.6265 *15,913*	0.8142 *20,681*	■	■	■	■	■	■	■	■	■	■	■	■	■
11/16	11	0.6890 *17,501*	0.8767 *22,268*				■	■	■	■	■	■	■	■	■	■
3/4	12	0.7515 *19,088*	0.9393 *23,858*				■	■	■	■	■	■	■	■	■	■
7/8	14	0.8765 *22,263*	1.0645 *27,038*				■	■	■	■	■	■	■	■	■	■
1	16	1.0015 *25,438*	1.1898 *30,221*				■	■	■	■	■	■	■	■	■	■
1 1/8	18	1.1265 *28,613*	1.3148 *33,396*						■	■	■	■	■	■	■	■
1 1/4	20	1.2515 *31,788*	1.4398 *36,571*								■	■	■	■	■	■
1 3/8	22	1.3765 *34,963*	1.5648 *39,746*								■	■	■	■	■	■
1 1/2	24	1.5015 *38,138*	1.7523 *44,508*								■	■	■	■	■	■
1 5/8	26	1.6265 *41,313*	1.8773 *47,683*										■	■	■	■
1 3/4	28	1.7515 *44,488*	2.0023 *50,858*										■	■	■	■
2	32	2.0015 *50,838*	2.2523 *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

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 1/32 inch)*
Surface treatment	
No code	Passivated CRES or anodized aluminium
C	Cadmium plated on CRES
J	Zinc-nickel plated on CRES
Oversize	
No code	Standard outer diameter size
Y1	0.005 in oversized outer diameter[1]
Y2	0.010 in oversized outer diameter
Y3	0.015 in oversized outer diameter[1]
Y4	0.020 in oversized outer diameter

[1] SKF option

More specifications

More options available than the standards offers.

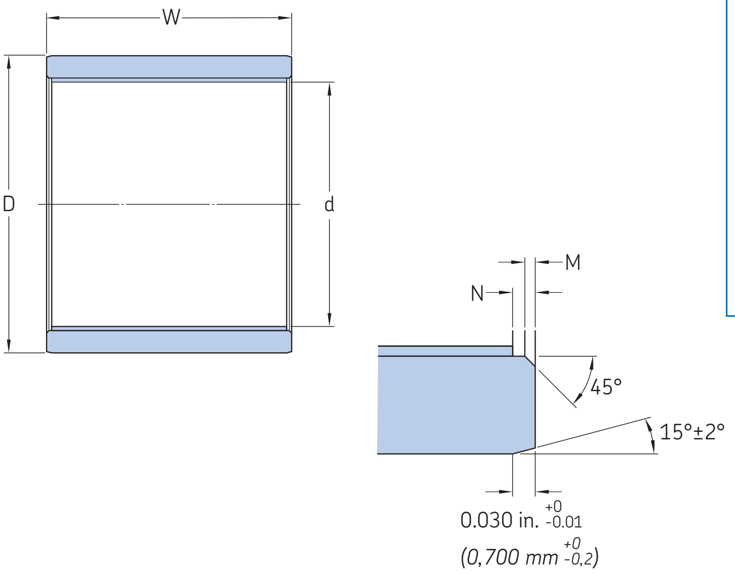
Customized journal bearings

Contact SKF at 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 length (W)	Per inch length (W)
24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	88	96		
in/*mm*																	lb/*g*	
																	0.016 *7,257*	0.006 *2,721*
																	0.019 *8,618*	0.007 *3,175*
																	0.022 *9,979*	0.008 *3,629*
■	■																0.025 *11,400*	0.009 *4,082*
■	■																0.028 *12,700*	0.011 *4,989*
■	■	■	■														0.031 *14,061*	0.012 *5,443*
■	■	■	■	■	■												0.056 *25,401*	0.021 *9,525*
■	■	■	■	■	■	■	■										0.06 *27,215*	0.022 *9,979*
■	■	■	■	■	■	■	■										0.065 *29,483*	0.024 *10,886*
■	■	■	■	■	■	■	■										0.075 *34,019*	0.028 *12,700*
■	■	■	■	■	■	■	■	■	■								0.084 *38,102*	0.031 *14,061*
■	■	■	■	■	■	■	■	■	■								0.094 *42,638*	0.035 *15,876*
■	■	■	■	■	■	■	■	■	■	■	■						0.103 *46,720*	0.038 *17,236*
■	■	■	■	■	■	■	■	■	■	■	■						0.113 *51,256*	0.041 *18,597*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		0.171 *77,564*	0.062 *28,123*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	0.183 *83,007*	0.067 *30,391*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	0.196 *88,904*	0.071 *32,205*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	0.222 *100,697*	0.081 *36,741*

4.7 Plain bearings, EN 4534-2 and EN 4536-2, inch dimensions

13E..Z..



Technical specification	EN 2311
Product standards	EN 4536-2 (Corrosion-resistant steel) EN 4534-2 (Aluminium alloy)
Standard materials	
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. 0,5*	max. 0.03 *max. 0,7*

Nominal bore Dia- meter	Code	Dimensions d 0/–0.0010 *0/–0,0254*	 D CRES 0/–0.0005 *(0/–0,013)* Aluminium alloy ±0.0005 *(±0,013)*	Length (W) 0/–0.01 *0/–0,254* 5/32 *3,97* **05**	 3/16 *4,76* **06**	 7/32 *5,56* **07**	 1/4 *6,35* **08**	 9/32 *7,14* **09**	 5/16 *7,94* **10**	 11/32 *8,73* **11**	 3/8 *9,53* **12**	 7/16 *11,11* **14**	 1/2 *12,7* **16**	 9/16 *14,29* **18**	 5/8 *15,88* **20**	 11/16 *17,46* **22**	 3/4 *19,05* **24**
in		in/*mm*		in/*mm*													
1/4	**04**	0.2515 *6,388*	0.3760 *9,550*	■	■	■	■	■	■	■	■	■ 1)					
5/16	**05**	0.3140 *7,976*	0.4386 *11,140*	■	■	■	■	■	■	■	■	■	■ 1)	■ 1)			
3/8	**06**	0.3765 *9,563*	0.5012 *12,730*	■	■	■	■	■	■	■	■	■	■	■	■ 1)	■ 1)	
7/16	**07**	0.4390 *11,151*	0.5638 *14,321*	■	■	■	■	■	■	■	■	■	■	■	■	■ 1)	■ 1)
1/2	**08**	0.5015 *12,738*	0.6265 *15,913*	■	■	■	■	■	■	■	■	■	■	■	■	■	■ 1)
9/16	**09**	0.5640 *14,326*	0.6892 *17,506*	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5/8	**10**	0.6265 *15,913*	0.8142 *20,681*	■	■	■	■	■	■	■	■	■	■	■	■	■	■
11/16	**11**	0.6890 *17,501*	0.8767 *22,268*				■	■	■	■	■	■	■	■	■	■	■
3/4	**12**	0.7515 *19,088*	0.9393 *23,858*				■	■	■	■	■	■	■	■	■	■	■
7/8	**14**	0.8765 *22,263*	1.0645 *27,038*				■	■	■	■	■	■	■	■	■	■	■
1	**16**	1.0015 *25,438*	1.1898 *30,221*				■	■	■	■	■	■	■	■	■	■	■
1 1/8	**18**	1.1265 *28,613*	1.3148 *33,396*						■	■	■	■	■	■	■	■	■
1 1/4	**20**	1.2515 *31,788*	1.4398 *36,571*								■	■	■	■	■	■	■
1 3/8	**22**	1.3765 *34,963*	1.5648 *39,746*								■	■	■	■	■	■	■
1 1/2	**24**	1.5015 *38,138*	1.7523 *44,508*								■	■	■	■	■	■	■
1 5/8	**26**	1.6265 *41,313*	1.8773 *47,683*										■	■	■	■	■
1 3/4	**28**	1.7515 *44,488*	2.0023 *50,858*										■	■	■	■	■
2	**32**	2.0015 *50,838*	2.2523 *57,208*										■	■	■	■	■

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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

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 1/32 inch)*

Surface treatment

No code	Passivated CRES or anodized aluminium
C1)	Cadmium plated on CRES
J1)	Zinc-nickel plated on CRES

Oversize

No code	Standard outer diameter size
Y11)	0.005 in oversized outer diameter
Y21)	0.010 in oversized outer diameter

1) SKF option

More specifications

More options and sizes available than the standards offers, see 1) and 2).

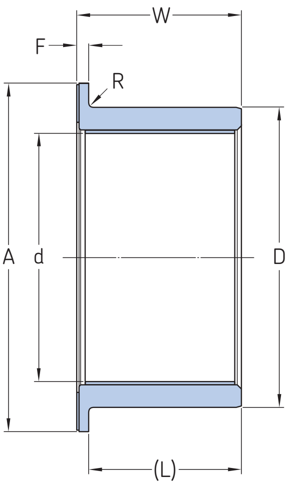
Customized journal bearings

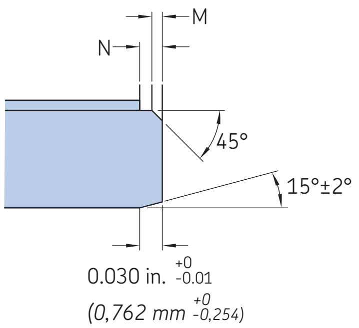
Contact SKF at skf.com/go/aero

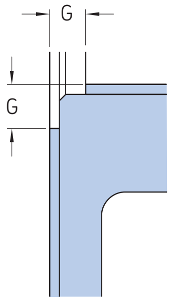
Length (W) 0/–0.01 *0/–0,254*																**Masses**	
7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 3/4	3	CRES	Aluminium alloy
22,23	*25,4*	*28,58*	*31,75*	*34,93*	*38,1*	*41,28*	*44,45*	*47,63*	*50,8*	*53,98*	*57,15*	*60,33*	*63,5*	*69,85*	*76,2*	Per inch length (W)	Per inch length (W)
28	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**	**76**	**80**	**88**	**96**		
in/*mm*																lb/*g*	
																0.017 *7,842*	0.006 *2,803*
																0.021 *9,414*	0.007 *3,365*
																0.024 *10,990*	0.009 *3,928*
1)																0.028 *12,571*	0.10 *4,493*
1)																0.031 *14,164*	0.011 *5,062*
1)	1)	2)														0.035 *15,762*	0.012 *5,634*
■	1)	1)	2)	2)												0.60 *27,101*	0.021 *9,686*
■	■	1)	1)	2)	2)	2)										0.065 *29,447*	0.023 *10,525*
■	■	1)	1)	1)	2)	2)										0.70 *31,821*	0.025 *11,373*
■	■	■	■	1)	1)	1)										0.081 *36,571*	0.029 *13,071*
■	■	■	■	■	1)	1)	1)	1)								0.091 *41,358*	0.033 *14,782*
■	■	■	■	■	■	1)	1)	1)								0.102 *46,079*	0.036 *16,470*
■	■	■	■	■	■	■	■	1)	1)	1)						0.112 *50,800*	0.40 *18,157*
■	■	■	■	■	■	■	■	■	1)	1)						0.122 *55,520*	0.044 *19,844*
■	■	■	■	■	■	■	■	■	■	■	1)	1)	1)	1)		0.180 *81,692*	0.064 *29,198*
■	■	■	■	■	■	■	■	■	■	■	■	1)	1)	1)	1)	0.194 *87,971*	0.069 *31,443*
■	■	■	■	■	■	■	■	■	■	■	■	■	1)	1)	1)	0.208 *94,250*	0.074 *33,687*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1)	0.235 *106,807*	0.084 *38,175*

4.8 Flanged bearings, NSA 8147, NSA 8148, 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 *max. 0,254*	max. 0.025 *max. 0,635*	0.03 $^{0}_{-0.010}$ *0,762* $^{0}_{-0,254}$	≈0.020 *≈0,508*
≥ 14	max. 0.020 *max. 0,508*	max. 0.025 *max. 0,635*	0.03 $^{0}_{-0.010}$ *0,762* $^{0}_{-0,254}$	≈0.040 *≈1,016*

Nominal bore Dia-meter	Code	**Dimensions** d Upper	d Lower	D Upper	D Lower	F 0/–0.005 *0/–0,127*	A 0/–0.010 *0/–0,254*	**Length (W)** –0.005/–0.015 (*–0,127/–0,381*) 5/32 *3,9688* 02[4]	3/16 *4,7625* 03	1/4 *6,35* 04	5/16 *7,94* 05	3/8 *9,53* 06	7/16 *11,11* 07	1/2 *12,7* 08
in		in/*mm*						in/*mm*						
1/4	04	0.2512 *6,380*	0.2503 *6,358*	0.3760 *9,550*	0.3755 *9,538*	0.062 *1,6*	0.500 *12,70*	■ 3)	■ 1)	■	■	■		
5/16	05	0.3139 *7,973*	0.3130 *7,950*	0.4386 *11,140*	0.4381 *11,128*	0.062 *1,6*	0.562 *14,28*	■ 3)	■ 1)	■	■	■	■ 3)	■
3/8	06	0.3765 *9,563*	0.3756 *9,540*	0.5011 *12,728*	0.5006 *12,715*	0.062 *1,6*	0.625 *15,87*	■ 1)	■ 1)	■	■	■	■ 3)	■
7/16	07	0.440 *11,188*	0.4395 *11,164*	0.627 *15,924*	0.626 *15,900*	0.062 *1,6*	0.752 *19,10*		■ 1)	■	■	■	■ 3)	■
1/2	08	0.5016 *12,741*	0.5006 *12,715*	0.6888 *17,496*	0.6883 *17,483*	0.062 *1,6*	0.875 *22,22*		■ 1)	■	■	■	■ 3)	■
5/8	10	0.6267 *15,918*	0.6257 *15,893*	0.8139 *20,673*	0.8134 *20,660*	0.062 *1,6*	1.000 *25,40*		■ 1)	■	■	■	■ 3)	■
3/4	12	0.7520 *19,101*	0.7508 *19,070*	0.9389 *23,848*	0.9384 *23,835*	0.062 *1,6*	1.125 *28,57*		■ 1)	■	■	■	■ 3)	■
7/8	14	0.8771 *22,278*	0.8759 *22,248*	1.0640 *27,026*	1.0635 *27,013*	0.062 *1,6*	1.250 *31,75*		■ 1)	■	■	■	■ 3)	■
1	16	1.0022 *25,456*	1.0010 *25,425*	1.1890 *30,201*	1.1885 *30,188*	0.062 *1,6*	1.375 *34,92*		■ 1)	■	■	■	■ 3)	■
1 1/8	18	1.1275 *28,639*	1.1263 *28,608*	1.3143 *33,383*	1.3137 *33,368*	0.094 *2,4*	1.625 *41,27*				■ 1)	■	■ 3)	■
1 1/4	20	1.2528 *31,821*	1.2512 *31,780*	1.5019 *38,148*	1.5013 *38,133*	0.094 *2,4*	1.750 *44,45*				■ 1)	■	■ 3)	■
1 3/8	22	1.3779 *34,999*	1.3763 *34,958*	1.6269 *41,323*	1.6263 *41,308*	0.094 *2,4*	1.875 *47,62*				■ 1)	■	■ 3)	■
1 1/2	24	1.5029 *38,174*	1.5013 *38,133*	1.7519 *44,498*	1.7513 *44,483*	0.094 *2,4*	2.000 *50,80*				■ 1)	■	■ 3)	■
1 3/4	28	1.7533 *44,534*	1.7517 *44,493*	2.0023 *50,858*	2.0016 *50,841*	0.094 *2,4*	2.250 *57,15*					■ 1)	■ 3)	■
2	32	2.0035 *50,889*	2.0017 *50,843*	2.2523 *57,208*	2.2516 *57,191*	0.094 *2,4*	2.500 *63,50*					■ 1)	■ 3)	■

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1) SKF option for corrosion-resistant steel bearings
2) SKF option for aluminium alloy bearings
3) SKF option
4) Code 02 corresponds to a length of 2,5/16 in

Designation system

Examples:	13AAF0404	13A	A	F	04	04			Y1
	13ASF1012C	13A	S	F	10	12		C	
	KAF0404PY2	K	A	F	04	04	P		Y2

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
C1)	Cadmium plated on CRES
J1)	Zinc-nickel plated on CRES

Oversize

No code	Standard outer diameter size
Y11)	0.005 in oversized outer diameter
Y21)	0.010 in oversized outer diameter

1) 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).

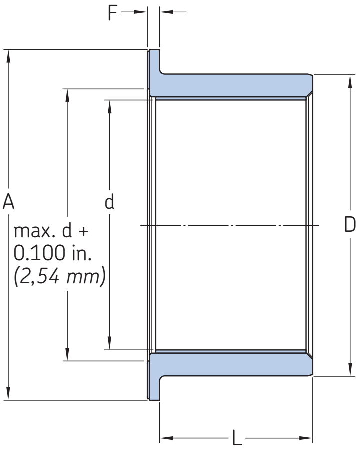
Customized journal bearings

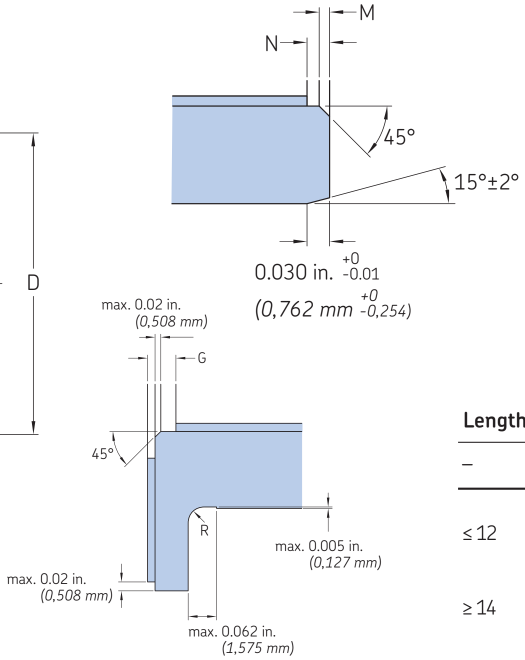
Contact SKF at skf.com/go/aero

Length (W) –0.005/–0.015 *(–0,127/–0,381)*											**Masses**			
5/8	3/4	13/16	7/8	1	1 1/4	1 1/2	2	2 1/2	3		CRES		Aluminium alloy	
15,88	*19,05*	*20,64*	*22,23*	*25,4*	*31,75*	*38,1*	*50,8*	*63,5*	*76,2*		Per inch length (L)	Flange	Per inch length (L)	Flange
10	**12**	**13**	**14**	**16**	**20**	**24**	**32**	**40**	**48**					
in/*mm*											lb/*g*			
											0.0132 *5,987*	0.0017 *0,771*	0.0077 *3,493*	0.0006 *0,272*
											0.0220 *9,979*	0.0020 *0,907*	0.0088 *3,992*	0.0007 *0,317*
●											0.0264 *11,975*	0.0022 *0,998*	0.0099 *4,491*	0.0008 *0,363*
●											0.0340 *15,422*	0.0028 *1,270*	0.0122 *5,534*	0.0010 *0,454*
●	●	● 3)	● 3)	● 1)							0.0550 *24,948*	0.0048 *2,177*	0.0209 *9,480*	0.0017 *0,771*
●	●	● 2)	● 3)	●	● 1)						0.0660 *29,937*	0.0056 *2,540*	0.0263 *11,929*	0.0020 *0,907*
●	●	● 3)	● 3)	●	●						0.0770 *34,927*	0.0063 *2,858*	0.0297 *13,472*	0.0023 *1,043*
●	●	● 3)	● 3)	●	●	● 1)					0.0825 *37,421*	0.0071 *3,220*	0.0330 *14,969*	0.0026 *1,179*
●	●	● 3)	● 3)	●	●	●					0.0924 *41,912*	0.0078 *3,538*	0.0374 *16,964*	0.0028 *1,270*
●	●	● 3)	● 3)	●	●	●	● 3)				0.1023 *46,402*	0.0233 *10,569*	0.0418 *18,960*	0.0084 *3,810*
●	●	● 3)	● 2)	●	●	●	● 2)				0.1606 *72,847*	0.0204 *9,253*	0.0638 *28,939*	0.0074 *3,357*
●	●	● 3)	● 3)	●	●	●	●				0.1760 *79,832*	0.0220 *9,979*	0.0693 *31,434*	0.0079 *3,583*
●	●	● 3)	● 3)	●	●	●	●	●			0.1903 *86,319*	0.0236 *10,705*	0.0748 *33,929*	0.0085 *3,855*
●	●	● 3)	● 3)	●	●	●	●	●	●		0.2200 *99,790*	0.0267 *12,111*	0.0858 *38,918*	0.0096 *4,354*
●	●	● 3)	● 3)	●	●	●	●	●	●		0.2475 *112,264*	0.0299 *13,562*	0.0979 *44,407*	0.0108 *4,899*

4.9 Flanged bearings, AS 81934/2, 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 *max. 0,127*	max. 0.010 *max. 0,254*	0.010 ±0.005 *0,254 ±0,127*	max. 0.055 *max. 1,397*
≥ 14	max. 0.015 *max. 0,381*	max. 0.025 *max. 0,635*	0.010 ±0.005 *0,254 ±0,127*	max. 0.055 *max. 1,397*

Nominal bore		**Dimensions**				**Length (L)** 0/–0.01 *0/–0,254*											
Diameter	Code	d 0/–0.0010 *0/–0,0254*	D 0/–0.0005[1] *0/–0,013*	F 0/–0.005 *0/–0,127*	A 0/–0.020 *0/–0,508*	5/32 *3,97* 05	3/16 *4,76* 06	7/32 *5,56* 07	1/4 *6,35* 08	9/32 *7,14* 09	5/16 *7,94* 10	11/32 *8,73* 11	3/8 *9,53* 12	7/16 *11,11* 14	1/2 *12,7* 16	9/16 *14,29* 18	5/8 *15,88* 20
in		in/*mm*				in/*mm*											
1/4	04	0.2515 *6,388*	0.3760 *9,550*	0.0625 *1,587*	0.750 *19,05*	■	■	■	■	■	■	■	■	■			
5/16	05	0.3140 *7,976*	0.4386 *11,140*	0.0625 *1,587*	0.812 *20,62*	■	■	■	■	■	■	■	■	■	■	■	
3/8	06	0.3765 *9,563*	0.5012 *12,730*	0.0625 *1,587*	0.875 *22,22*	■	■	■	■	■	■	■	■	■	■	■	■
7/16	07	0.4390 *11,151*	0.5638 *14,321*	0.0625 *1,587*	0.937 *23,80*	■	■	■	■	■	■	■	■	■	■	■	■
1/2	08	0.5015 *12,738*	0.6265 *15,913*	0.0625 *1,587*	1.000 *25,40*	■	■	■	■	■	■	■	■	■	■	■	■
9/16	09	0.5640 *14,326*	0.6892 *17,506*	0.0625 *1,587*	1.125 *28,57*	■	■	■	■	■	■	■	■	■	■	■	■
5/8	10	0.6265 *15,913*	0.8142 *20,681*	0.0625 *1,587*	1.250 *31,75*	■	■	■	■	■	■	■	■	■	■	■	■
11/16	11	0.6890 *17,501*	0.8767 *22,268*	0.0625 *1,587*	1.375 *34,92*				■	■	■	■	■	■	■	■	■
3/4	12	0.7515 *19,088*	0.9393 *23,858*	0.0625 *1,587*	1.500 *38,10*				■	■	■	■	■	■	■	■	■
7/8	14	0.8765 *22,263*	1.0645 *27,038*	0.0625 *1,587*	1.625 *41,27*				■	■	■	■	■	■	■	■	■
1	16	1.0015 *25,438*	1.1898 *30,221*	0.0625 *1,587*	1.750 *44,45*				■	■	■	■	■	■	■	■	■
1 1/8	18	1.1265 *28,613*	1.3148 *33,396*	0.0937 *2,380*	1.875 *47,62*						■	■	■	■	■	■	■
1 1/4	20	1.2515 *31,788*	1.4398 *36,571*	0.0937 *2,380*	2.000 *50,80*								■	■	■	■	■
1 3/8	22	1.3765 *34,963*	1.5648 *39,746*	0.0937 *2,380*	2.125 *53,97*								■	■	■	■	■
1 1/2	24	1.5015 *38,138*	1.7523 *44,508*	0.0937 *2,380*	2.250 *57,15*								■	■	■	■	■
1 5/8	26	1.6265 *41,313*	1.8773 *47,683*	0.0937 *2,380*	2.375 *60,32*										■	■	■
1 3/4	28	1.7515 *44,488*	2.0023 *50,858*	0.0937 *2,380*	2.500 *63,50*										■	■	■
2	32	2.0015 *50,838*	2.2523 *57,208*	0.0937 *2,380*	2.750 *69,85*										■	■	■

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[1] 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

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 1/32 inch)*

Surface treatment

No code	Passivated CRES or anodized aluminium
C	Cadmium plated on CRES
J	Zinc-nickel plated on CRES

Oversize

No code	Standard outer diameter size
Y1[1]	0.005 in oversized outer diameter
Y2	0.010 in oversized outer diameter
Y3[1]	0.015 in oversized outer diameter
Y4	0.020 in oversized outer diameter

[1] SKF option

More specifications

More options available than the standards offers.

Customized journal bearings

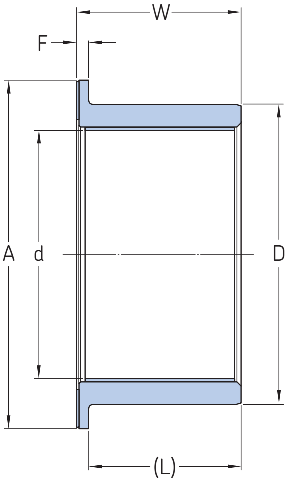
Contact SKF at skf.com/go/aero

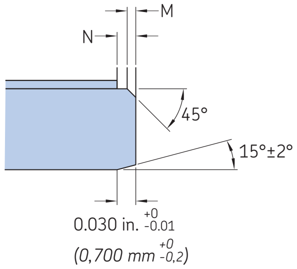
Length (L) 0/–0.01 *0/–0,254*																		**Masses**			
11/16	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 3/4	3	CRES		Aluminium alloy	
17,46	*19,05*	*22,23*	*25,4*	*28,58*	*31,75*	*34,93*	*38,1*	*41,28*	*44,45*	*47,63*	*50,8*	*53,98*	*57,15*	*60,33*	*63,5*	*69,85*	*76,2*	Per inch length (L)	Flange	Per inch length (L)	Flange
22	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	88	96				
in/*mm*																		lb/*g*			
																		0.017 *7,711*	0.007 *3,175*	0.006 *2,722*	0.003 *1,361*
																		0.022 *9,979*	0.007 *3,175*	0.008 *3,629*	0.003 *1,361*
●																		0.025 *11,340*	0.007 *3,175*	0.009 *4,082*	0.003 *1,361*
●	●	●																0.028 *12,701*	0.008 *3,629*	0.010 *4,536*	0.003 *1,361*
●	●	●																0.031 *14,061*	0.010 *4,536*	0.011 *4,989*	0.004 *1,814*
●	●	●	●	●														0.036 *16,329*	0.011 *4,989*	0.013 *5,897*	0.004 *1,814*
●	●	●	●	●	●	●												0.061 *27,669*	0.014 *6,350*	0.022 *9,979*	0.005 *2,268*
●	●	●	●	●	●	●	●	●										0.064 *29,030*	0.020 *9,072*	0.023 *10,433*	0.007 *3,175*
●	●	●	●	●	●	●	●	●										0.070 *31,751*	0.023 *10,433*	0.025 *11,340*	0.009 *4,082*
●	●	●	●	●	●	●	●	●										0.080 *36,287*	0.025 *11,340*	0.029 *13,154*	0.009 *4,082*
●	●	●	●	●	●	●	●	●	●	●								0.091 *41,277*	0.027 *12,247*	0.033 *14,968*	0.010 *4,536*
●	●	●	●	●	●	●	●	●	●	●								0.101 *45,813*	0.041 *18,597*	0.037 *16,783*	0.014 *6,350*
●	●	●	●	●	●	●	●	●	●	●	●	●						0.111 *50,349*	0.050 *22,680*	0.040 *18,144*	0.018 *8,165*
●	●	●	●	●	●	●	●	●	●	●	●	●						0.122 *55,338*	0.053 *24,040*	0.044 *19,958*	0.019 *8,618*
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		0.179 *81,193*	0.054 *24,494*	0.065 *29,484*	0.019 *8,618*
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.193 *87,543*	0.056 *25,401*	0.070 *31,751*	0.020 *9,072*
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.207 *93,894*	0.064 *29,030*	0.075 *34,019*	0.023 *10,433*
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.234 *106,141*	0.072 *32,659*	0.085 *38,555*	0.026 *11,793*

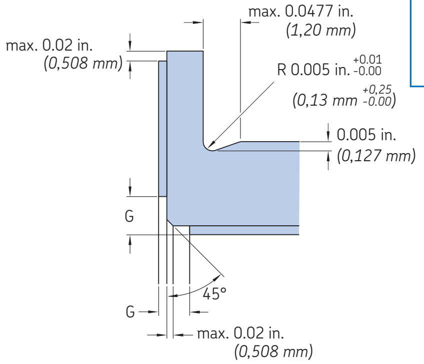
4.10 Flanged bearings, EN 4535-2 and EN 4537-2, code U, inch dimensions

13E..F..

For code R, see **page 414**







Technical specification	EN 2311
Product standards	EN 4537-2 (Corrosion-resistant steel) EN 4535-2 (Aluminium alloy)
Standard materials	
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 *max. 0,5*	max. 0.03 *max. 0,7*	max. 0.028 max. 0,70
≥ 14	max. 0.02 *max. 0,5*	max. 0.03 *max. 0,7*	max. 0.039 max. 1,00

Nominal bore		**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	Code	0/–0.0010	0/–0.0005 3)	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	04	0.2515 *6,388*	0.3760 *9,550*	0.0625 *1,587*	0.7500 *19,050*	●	●	●	●	●	●	●	1)	1)				
5/16	05	0.3140 *7,976*	0.4386 *11,140*	0.0625 *1,587*	0.8130 *20,650*	●	●	●	●	●	●	●	●	●	1)	1)		
3/8	06	0.3765 *9,563*	0.5012 *12,730*	0.0625 *1,587*	0.8750 *22,225*	●	●	●	●	●	●	●	●	●	●	1)	1)	1)
7/16	07	0.4390 *11,151*	0.5638 *14,321*	0.0625 *1,587*	0.9380 *23,825*	●	●	●	●	●	●	●	●	●	●	●	1)	1)
1/2	08	0.5015 *12,738*	0.6265 *15,913*	0.0625 *1,587*	1.0000 *25,400*	●	●	●	●	●	●	●	●	●	●	●	●	●
9/16	09	0.5640 *14,326*	0.6892 *17,506*	0.0625 *1,587*	1.1250 *28,575*	●	●	●	●	●	●	●	●	●	●	●	●	●
5/8	10	0.6265 *15,913*	0.8142 *20,681*	0.0625 *1,587*	1.2500 *31,750*	●	●	●	●	●	●	●	●	●	●	●	●	●
11/16	11	0.6890 *17,501*	0.8767 *22,268*	0.0625 *1,587*	1.3750 *34,924*			●	●	●	●	●	●	●	●	●	●	●
3/4	12	0.7515 *19,088*	0.9393 *23,858*	0.0625 *1,587*	1.5000 *38,099*			●	●	●	●	●	●	●	●	●	●	●
7/8	14	0.8765 *22,263*	1.0645 *27,038*	0.0625 *1,587*	1.6250 *41,274*			●	●	●	●	●	●	●	●	●	●	●
1	16	1.0015 *25,438*	1.1898 *30,221*	0.0625 *1,587*	1.7500 *44,449*			●	●	●	●	●	●	●	●	●	●	●
1 1/8	18	1.1265 *28,613*	1.3148 *33,396*	0.094 *2,390*	1.8750 *47,624*					●	●	●	●	●	●	●	●	●
1 1/4	20	1.2515 *31,788*	1.4398 *36,571*	0.094 *2,390*	2.0000 *50,799*							●	●	●	●	●	●	●
1 3/8	22	1.3765 *34,963*	1.5648 *39,746*	0.094 *2,390*	2.1250 *53,974*							●	●	●	●	●	●	●
1 1/2	24	1.5015 *38,138*	1.7523 *44,508*	0.094 *2,390*	2.2500 *57,149*							●	●	●	●	●	●	●
1 5/8	26	1.6265 *41,313*	1.8773 *47,683*	0.094 *2,390*	2.3750 *60,324*									●	●	●	●	●
1 3/4	28	1.7515 *44,488*	2.0023 *50,858*	0.094 *2,390*	2.5000 *63,499*									●	●	●	●	●
2	32	2.0015 *50,838*	2.2523 *57,208*	0.094 *2,390*	2.7500 *69,850*									●	●	●	●	●

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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)*

Designation system

Examples:								
13EAF0406UY1	13E	A	F	04	06	U		Y1
13EAF0406R	13E	A	F	04	06	R		
13ESF1636UJY2	13E	S	F	16	36	U	J	Y2

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 1/32 inch)*

Geometry
U Undercut behind flange
R Radius behind flange (see **page 414**)

Surface treatment
No code Passivated CRES or anodized aluminium
C1) Cadmium plated on CRES1)
J1) Zinc-nickel plated on CRES1)

Oversize
No code Standard outer diameter size
Y11) 0.005 in oversized outer diameter
Y21) 0.010 in oversized outer diameter

1) SKF option

More specifications

More options and sizes available than the standards offers, see 1) and 2).

Customized journal bearings

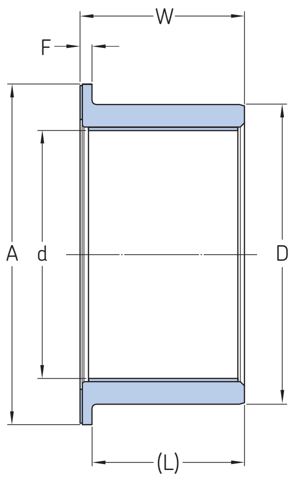
Contact SKF at skf.com/go/aero

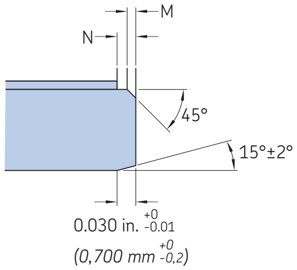
Length (W) –0.004/–0.016 –0,10/–0,40																Masses (Code U)			
7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 3/4	3	CRES		Aluminium alloy	
22,23	*25,4*	*28,58*	*31,75*	*34,93*	*38,1*	*41,28*	*44,45*	*47,63*	*50,8*	*53,98*	*57,15*	*60,33*	*63,5*	*69,85*	*76,2*	Per inch length (L)	Flange	Per inch length (L)	Flange
28	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**	**76**	**80**	**88**	**96**				
in/*mm*																lb/*g*			
																0.017 *7,842*	0.0059 *2,698*	0.006 *2,803*	0.0021 *0,965*
																0.021 *9,414*	0.0067 *3,036*	0.007 *3,365*	0.0024 *1,086*
																0.024 *10,990*	0.0075 *3,384*	0.009 *3,928*	0.0027 *1,211*
■ 1)																0.028 *12,571*	0.0082 *3,724*	0.010 *4,493*	0.0029 *1,333*
■ 1)																0.031 *14,164*	0.0090 *4,073*	0.011 *5,062*	0.0032 *1,458*
■ 1)	■ 1)	■ 1)														0.035 *15,762*	0.0114 *5,185*	0.012 *5,634*	0.0041 *1,855*
■	■ 1)	■ 1)	■ 1)	■ 2)												0.060 *27,101*	0.0142 *6,437*	0.021 *9,686*	0.0051 *2,303*
■	■	■ 1)	■ 1)	■ 1)	■ 2)	■ 2)										0.065 *29,447*	0.0172 *7,818*	0.023 *10,525*	0.0062 *2,797*
■	■	■ 1)	■ 1)	■ 1)	■ 1)	■ 2)										0.070 *31,821*	0.0206 *9,340*	0.025 *11,373*	0.0074 *3,341*
■	■	■	■	■ 1)	■ 1)	■ 1)										0.081 *36,571*	0.0229 *10,382*	0.029 *13,071*	0.0082 *3,714*
■	■	■	■	■	■ 1)	■ 1)	■ 1)	■ 1)								0.091 *41,358*	0.0252 *11,432*	0.033 *14,782*	0.0090 *4,090*
■	■	■	■	■	■	■	■ 1)	■ 1)	■ 1)							0.102 *46,079*	0.0424 *19,211*	0.036 *16,470*	0.0152 *6,873*
■	■	■	■	■	■	■	■	■ 1)	■ 1)	■ 1)						0.112 *50,800*	0.0459 *20,828*	0.040 *18,157*	0.0164 *7,452*
■	■	■	■	■	■	■	■	■	■	■ 1)						0.122 *55,520*	0.0495 *22,432*	0.044 *19,844*	0.0177 *8,026*
■	■	■	■	■	■	■	■	■	■	■	■ 1)	■ 1)	■ 1)	■ 1)		0.180 *81,692*	0.0530 *24,051*	0.064 *29,198*	0.0190 *8,606*
■	■	■	■	■	■	■	■	■	■	■	■	■ 1)	■ 1)	■ 1)	■ 1)	0.194 *87,971*	0.0566 *25,654*	0.069 *31,443*	0.0202 *9,180*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■ 1)	■ 1)	0.208 *94,250*	0.0601 *27,274*	0.074 *33,687*	0.0215 *9,759*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■ 1)	0.235 *106,807*	0.0672 *30,497*	0.084 *38,175*	0.0241 *10,913*

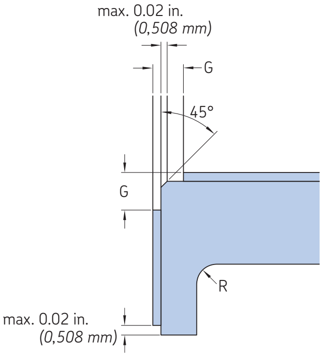
4.10 Flanged bearings, EN 4535-2 and EN 4537-2, code R, inch dimensions

13E..F..

For code U, see **page 412**







Technical specification **Product standards**	EN 2311 EN 4537-2 (Corrosion-resistant steel) EN 4535-2 (Aluminium alloy)
Standard materials	
Corrosion-resistant steel:	17-4PH
Surface treatment:	Passivated
Aluminium alloy:	2024
Surface treatment:	Sulfuric acid anodized
Liner:	X1

Nominal bore code	R	M	N	G
–	in/*mm*			
04	0.010 ±0.005 *0,25 ±0,13*	max. 0.02 *max. 0,50*	max. 0.03 *max. 0,70*	max. 0.028 max. 0,70
05	0.020 ±0.005 *0,50 ±0,13*	max. 0.02 *max. 0,50*	max. 0.03 *max. 0,70*	max 0.028 max. 0,70
06 to 12	0.026 ±0.005 *0,65 ±0,13*	max. 0.02 *max. 0,50*	max. 0.03 *max. 0,70*	max 0.028 max. 0,70
≥ 14	0.026 ±0.005 *0,65 ±0,13*	max. 0.02 *max. 0,50*	max. 0.03 *max. 0,70*	max 0.039 max. 1,00

Nominal bore		**Dimensions**				**Length (W)** –0.004/–0.016 *–0,10/–0,40*												
		d	D	F	A (Code R)	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	Code	0/–0.0010 *0/–0,0254*	0/–0.0005 3) *0/–0,0127*	0/–0.005 *0/–0,127*	0/–0.020 *0/–0,508*	*4,76* 06	*5,56* 07	*6,35* 08	*7,14* 09	*7,94* 10	*8,73* 11	*9,53* 12	*11,11* 14	*12,7* 16	*14,29* 18	*15,88* 20	*17,46* 22	*19,05* 24
in		in/*mm*				in/*mm*												
1/4	04	0.2515 *6,388*	0.3760 *9,550*	0.0625 *1,587*	0.5000 *12,700*	■	■	■	■	■	■	■	1)	1)				
5/16	05	0.3140 *7,976*	0.4386 *11,140*	0.0625 *1,587*	0.5630 *14,290*	■	■	■	■	■	■	■	■	■	1)	1)		
3/8	06	0.3765 *9,563*	0.5012 *12,730*	0.0625 *1,587*	0.6250 *15,880*	■	■	■	■	■	■	■	■	■	■	1)	1)	1)
7/16	07	0.4390 *11,151*	0.5638 *14,321*	0.0625 *1,587*	0.7500 *19,050*	■	■	■	■	■	■	■	■	■	■	■	1)	1)
1/2	08	0.5015 *12,738*	0.6265 *15,913*	0.0625 *1,587*	0.8750 *22,230*	■	■	■	■	■	■	■	■	■	■	■	■	■
9/16	09	0.5640 *14,326*	0.6892 *17,506*	0.0625 *1,587*	0.9380 *23,820*	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)
5/8	10	0.6265 *15,913*	0.8142 *20,681*	0.0625 *1,587*	1.0000 *25,400*	■	■	■	■	■	■	■	■	■	■	■	■	■
11/16	11	0.6890 *17,501*	0.8767 *22,268*	0.0625 *1,587*	1.0630 *26,990*			■	■	■	■	■	■	■	■	■	■	■
3/4	12	0.7515 *19,088*	0.9393 *23,858*	0.0625 *1,587*	1.1250 *28,580*			■	■	■	■	■	■	■	■	■	■	■
7/8	14	0.8765 *22,263*	1.0645 *27,038*	0.0625 *1,587*	1.2500 *31,750*			■	■	■	■	■	■	■	■	■	■	■
1	16	1.0015 *25,438*	1.1898 *30,221*	0.0625 *1,587*	1.3750 *34,930*			■	■	■	■	■	■	■	■	■	■	■
1 1/8	18	1.1265 *28,613*	1.3148 *33,396*	0.094 *2,390*	1.6250 *41,280*					■	■	■	■	■	■	■	■	■
1 1/4	20	1.2515 *31,788*	1.4398 *36,571*	0.094 *2,390*	1.7500 *44,450*							■	■	■	■	■	■	■
1 3/8	22	1.3765 *34,963*	1.5648 *39,746*	0.094 *2,390*	1.8750 *47,630*							■	■	■	■	■	■	■
1 1/2	24	1.5015 *38,138*	1.7523 *44,508*	0.094 *2,390*	2.0000 *50,800*							■	■	■	■	■	■	■
1 5/8	26	1.6265 *41,313*	1.8773 *47,683*	0.094 *2,390*	2.1250 *53,980*									2)	2)	2)	2)	2)
1 3/4	28	1.7515 *44,488*	2.0023 *50,858*	0.094 *2,390*	2.2500 *57,150*									■	■	■	■	■
2	32	2.0015 *50,838*	2.2523 *57,208*	0.094 *2,390*	2.5000 *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)*

Designation system

Examples:									
	13EAF0406UY1	13E	A	F	04	06	U		Y1
	13EAF0406R	13E	A	F	04	06	R		
	13ESF1636UJY2	13E	S	F	16	36	U	J	Y2

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 1/32 inch)*

Geometry

U	Undercut behind flange (see **page 412**)
R	Radius behind flange

Surface treatment

No code	Passivated CRES or anodized aluminium
C1)	Cadmium plated on CRES
J1)	Zinc-nickel plated on CRES

Oversize

No code	Standard outer diameter size
Y11)	0.005 in oversized outer diameter
Y21)	0.010 in oversized outer diameter

1) SKF option

More specifications

More options and sizes available than the standards offers, see 1) and 2).

Customized journal bearings

Contact SKF at skf.com/go/aero

Length (W) –0.004/–0.016 *–0.10/–0.40*																**Masses (Code R)**			
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 length (L)	Flange	Per inch length (L)	Flange
28	32	36	40	44	48	52	56	60	64	68	72	76	80	88	96				
in/*mm*																lb/*g*			
																0.017 *7,842*	0.0026 *1,177*	0.006 *2,803*	0.0009 *0,421*
																0.021 *9,414*	0.0030 *1,373*	0.007 *3,365*	0.0011 *0,491*
																0.024 *10,990*	0.0035 *1,570*	0.009 *3,928*	0.0012 *0,561*
1)																0.028 *12,571*	0.0051 *2,329*	0.010 *4,493*	0.0018 *0,832*
1)																0.031 *14,164*	0.0071 *3,239*	0.011 *5,062*	0.0026 *1,158*
2)	2)	2)														0.035 *15,762*	0.0077 *3,498*	0.012 *5,634*	0.0028 *1,250*
■	1)	1)	1)	2)												0.060 *27,101*	0.0084 *3,825*	0.021 *9,686*	0.0030 *1,367*
■	■	1)	1)	1)	2)	2)										0.065 *29,447*	0.0091 *4,120*	0.023 *10,525*	0.0032 *1,473*
■	■	1)	1)	1)	1)	2)										0.070 *31,821*	0.0097 *4,416*	0.025 *11,373*	0.0035 *1,578*
■	■	1)	1)	1)	1)	1)										0.081 *36,571*	0.011 *5,001*	0.029 *13,071*	0.0039 *1,788*
■	■	■	■	■	1)	1)	1)	1)								0.091 *41,358*	0.0123 *5,593*	0.033 *14,782*	0.0044 *1,999*
■	■	■	■	■	■	■	1)	1)	1)							0.102 *46,079*	0.0284 *12,901*	0.036 *16,470*	0.0102 *4,611*
■	■	■	■	■	■	■	■	1)	1)	1)						0.112 *50,800*	0.031 *14,067*	0.040 *18,157*	0.0111 *5,028*
■	■	■	■	■	■	■	■	■	■	1)						0.122 *55,520*	0.0336 *15,246*	0.044 *19,844*	0.012 *5,449*
■	■	■	■	■	■	■	■	■	■	■	1)	1)	1)	1)		0.180 *81,692*	0.0362 *16,411*	0.064 *29,198*	0.0129 *5,865*
2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	2)	0.194 *87,971*	0.0387 *17,560*	0.069 *31,443*	0.0138 *6,276*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	1)	1)	0.194 *87,971*	0.0413 *18,755*	0.069 *31,443*	0.0148 *6,703*
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1)	0.208 *94,250*	0.0465 *21,099*	0.074 *33,687*	0.0166 *7,541*

Cross-reference

Metric bearings

EN part number	SKF designation	
EN2285–**dW**AR	**dW**AAK	13C**dW**AAZ
EN2286–**dW**AR	**dW**FAAK	13C**dW**AAF
EN2287–**dW**A	**dW**SK	13C**dW**SZ
EN2288–**dW**	**dW**FSK	13C**dW**SF

Where
d = inner diameter of journal bearing
W = overall width of journal bearing

Example

EN part number	SKF designation	
EN2285–**2022**AR	**2022**AAK	13C**2022**AAZ
EN2288–**5040**	**5040**FSK	13C**5040**SF

Inch bearings

EN part number	SKF designation
EN4534-2V**d**0**W**	13EAZ**dW**
EN4536-2T**d**0**W**	13ESZ**dW**
EN4535-2D**d**V0**W**	13EAF**dW**U
EN4535-2F**d**V0**W**	13EAF**dW**R
EN4537-2D**d**T0**W**	13ESF**dW**U
EN4537-2F**d**T0**W**	13ESF**dW**R

Where
d = inner diameter of journal bearing
W = overall width of journal bearing

Example

EN part number	SKF designation
EN4536-2T**09**0**06**	13ESZ**0906**
EN4535-2D**04**V0**12**	13EAF**0412**U

AS part number	SKF designation
M81934/1-**d**A0**W**	13BAZ**dW**
M81934/1-**d**C0**W**	13BSZ**dW**
M81934/1-**d**C0**W**P	13BSZ**dW**C
M81934/1-**d**C0**W**E	13BSZ**dW**J
M81934/1-**d**A0**W**T	13BAZ**dW**Y2
M81934/1-**d**C0**W**T	13BSZ**dW**Y2
M81934/1-**d**C0**W**PT	13BSZ**dW**CY2
M81934/1-**d**C0**W**ET	13BSZ**dW**JY2
M81934/1-**d**A0**W**U	13BAZ**dW**Y4
M81934/1-**d**C0**W**U	13BSZ**dW**Y4
M81934/1-**d**C0**W**PU	13BSZ**dW**CY4
M81934/1-**d**C0**W**EU	13BSZ**dW**JY4
M81934/2-**d**A0**L**	13BAF**dL**
M81934/2-**d**C0**L**	13BSF**dL**
M81934/2-**d**C0**L**P	13BSF**dL**C
M81934/2-**d**C0**L**E	13BSF**dL**J
M81934/2-**d**A0**L**T	13BAF**dL**Y2
M81934/2-**d**C0**L**T	13BSF**dL**Y2
M81934/2-**d**C0**L**PT	13BSF**dL**CY2
M81934/2-**d**C0**L**ET	13BSF**dL**JY2
M81934/2-**d**A0**L**U	13BAF**dL**Y4
M81934/2-**d**C0**L**U	13BSF**dL**Y4
M81934/2-**d**C0**L**PU	13BSF**dL**CY4
M81934/2-**d**C0**L**EU	13BSF**dL**JY4

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-**08**C0**14**	13BSZ**0814**
M81934/2-**20**A0**32**U	13BAF**2032**Y4

NSA part number	SKF designation	
NSA8145-**d**-**X**	KS**dW**P	13ASZ**dW**
NSA8146-**d**-**X**	KA**dW**P	13AAZ**dW**
NSA8147-**d**-**X**	KSF**dW**P	13ASF**dW**
NSA8148-**d**-**X**	KAF**dW**P	13AAF**dW**

Where
d = inner diameter of journal bearing
W = overall width of journal bearing
X = W × 2 (except for W = 02 where X = 05)

Example

NSA part number	SKF designation	
NSA8145-**08**-**12**	KS**0806**P	13ASZ**0806**
NSA8146-**06**-**08**	KA**0604**P	13AAZ**0604**

5

Engineered pulleys

5 Engineered pulleys

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.

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 20**, pulley bearings with a cage provide:

- Reduced friction
- Reduced load carrying capability. Refer to *Load carrying capability* **page 421** 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 421**), 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 421**, *Sealing solutions* **page 422**, *Surface treatments* **page 422** and *Internal clearance* **page 421**, are then selected.

Figure 1

Pulley and pulley rolling bearing

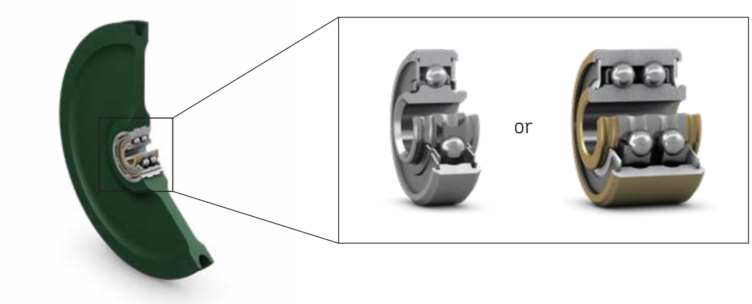


Figure 2

Pulley designs

Load carrying capability

Pulleys can sustain static radial loads and dynamic loads.

The load carrying capability of pulleys is described by:

CE	Endurance dynamic load
CR	Radial static load of the pulley
CB	Groove flange strength static load
CL	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 37**.

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.

Figure 3

Pulley grooves

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 20** 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

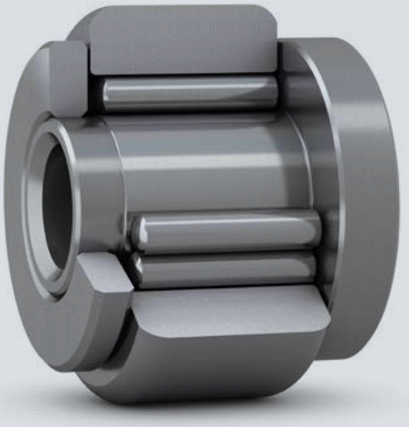
Standard greases

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

Table 2

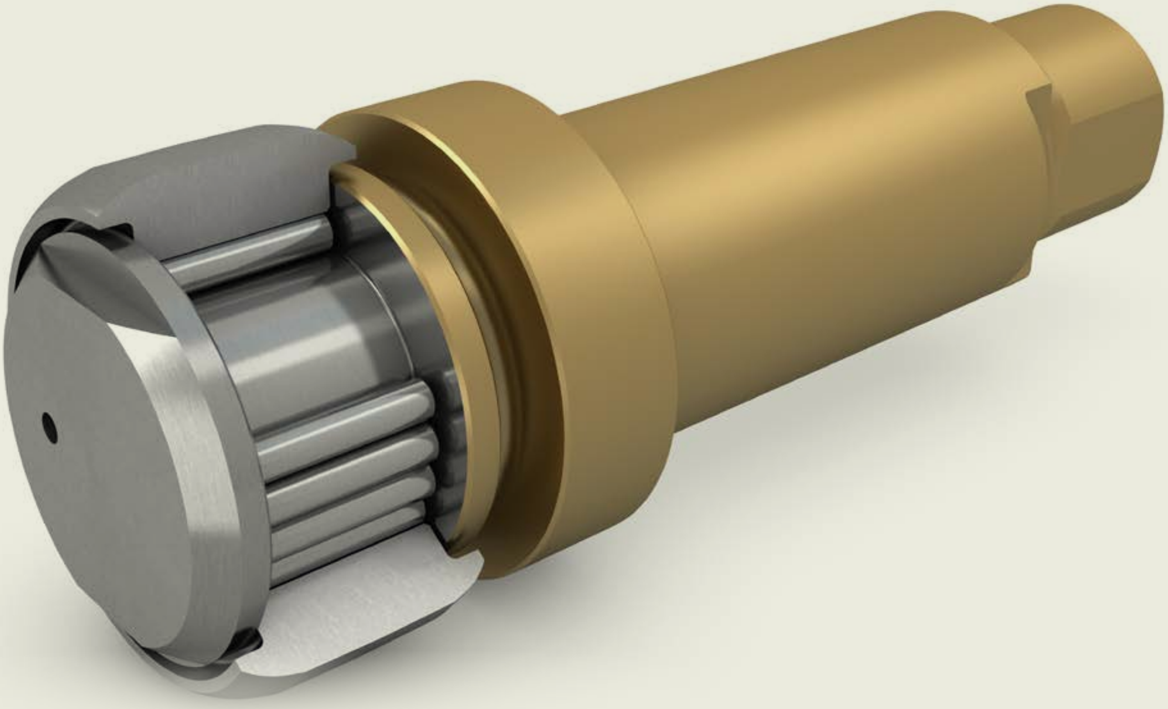
Pulley rolling bearing materials

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

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 20** 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 426**) 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 427**, *Materials* **page 427** and *Surface treatments* **page 427** are then selected.

Load carrying capability

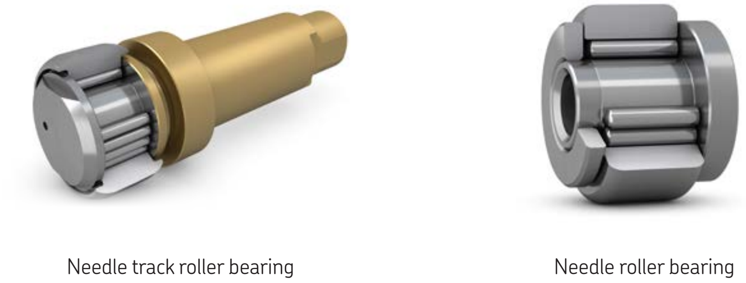
Needle bearings can accommodate static and dynamic radial loads, as defined in *Rolling bearings – Load carrying capabilities* **page 27**.

Bearing life depends on many parameters, such as load, speed, oscillation angle, lubrication and environmental conditions.

Contact SKF for more information.

Figure 1

Needle bearing designs



Needle track roller bearing

Needle roller bearing

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[1]
- 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 type I	MIL PRF 23827 type I	–73 to +121 °C *(–100 to +250 °F)*
G395	MIL PRF 81322	–54 to +177 °C *(–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).

---

[1] Treatment includes chromium 6 compounds and may be subject to environmental legislation

7

Engineered composite solutions

7 Engineered composite solutions

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 270**, *Spherical plain bearings* **page 116**, *Rolling bearings* **page 20** and *Self-lubricating journal bearings* **page 380**.

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 431**.

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 270** 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 for more customized designs.

Figure 2

Adjustable rods

Figure 3

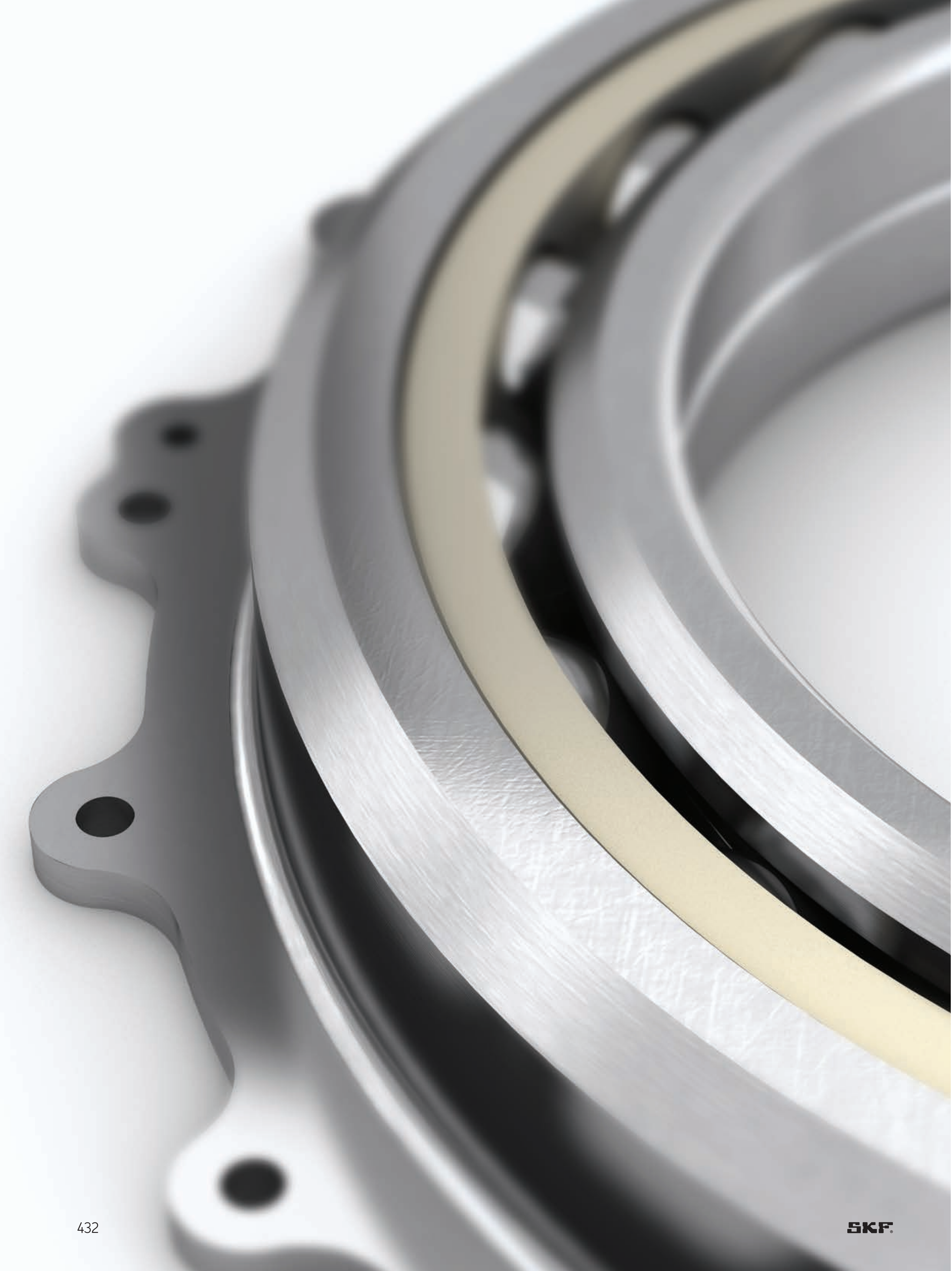
Examples of other composite solutions

SKF Black Design composite fitting

Customized rod design

Universal joints

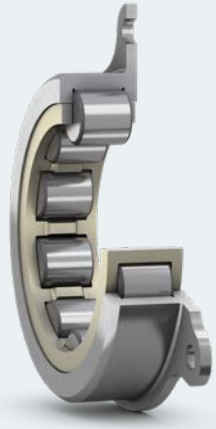
Double fork end



B Customized bearings for aeroengine solutions

8

Customized bearings for aeroengine solutions



8 Customized bearings for aeroengine solutions

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 drivetrains: 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.

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_m[1])**
Low to normal	< 150 °C (*< 302 °F*)	< 1,5 million nd_m
Normal to high	150 °C to 220 °C (*302 °F to 428 °F*)	1,5 to 2,5 million nd_m
High to very high	> 220 °C (*> 428 °F*)	> 2,5 million nd_m

---

[1] The speed factor nd_m 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	++ [1]	+++	--	++	-	++++	++	+++
Cylindrical roller bearings	1 row	+++	-	--	+	-	++++	+++	+++
	2 rows	+++	++	--	+	+	+++	++++	++
Tapered roller bearings	1 row	++++	+++ ←	++	-	-	+++	+++	+
	2 rows pre-loaded	++++	+++	++	+	+	++	++++	-
Spherical roller bearings	1 row	+++	++	--	++++	++	++	+++	++
	2 rows	++++	++	--	++++	++	++	++++	++

++++ excellent
+++ very good
++ good
+ fair
- poor
← single direction

---

[1] 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 [1]	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

[1] 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.

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 has 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	+	+	++	++
			Nitrided	+	+	+++	++
M50-NiL	C-13MoCrNiV40	AMS 6278	Carburized	+	+++	++	++
			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.

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.

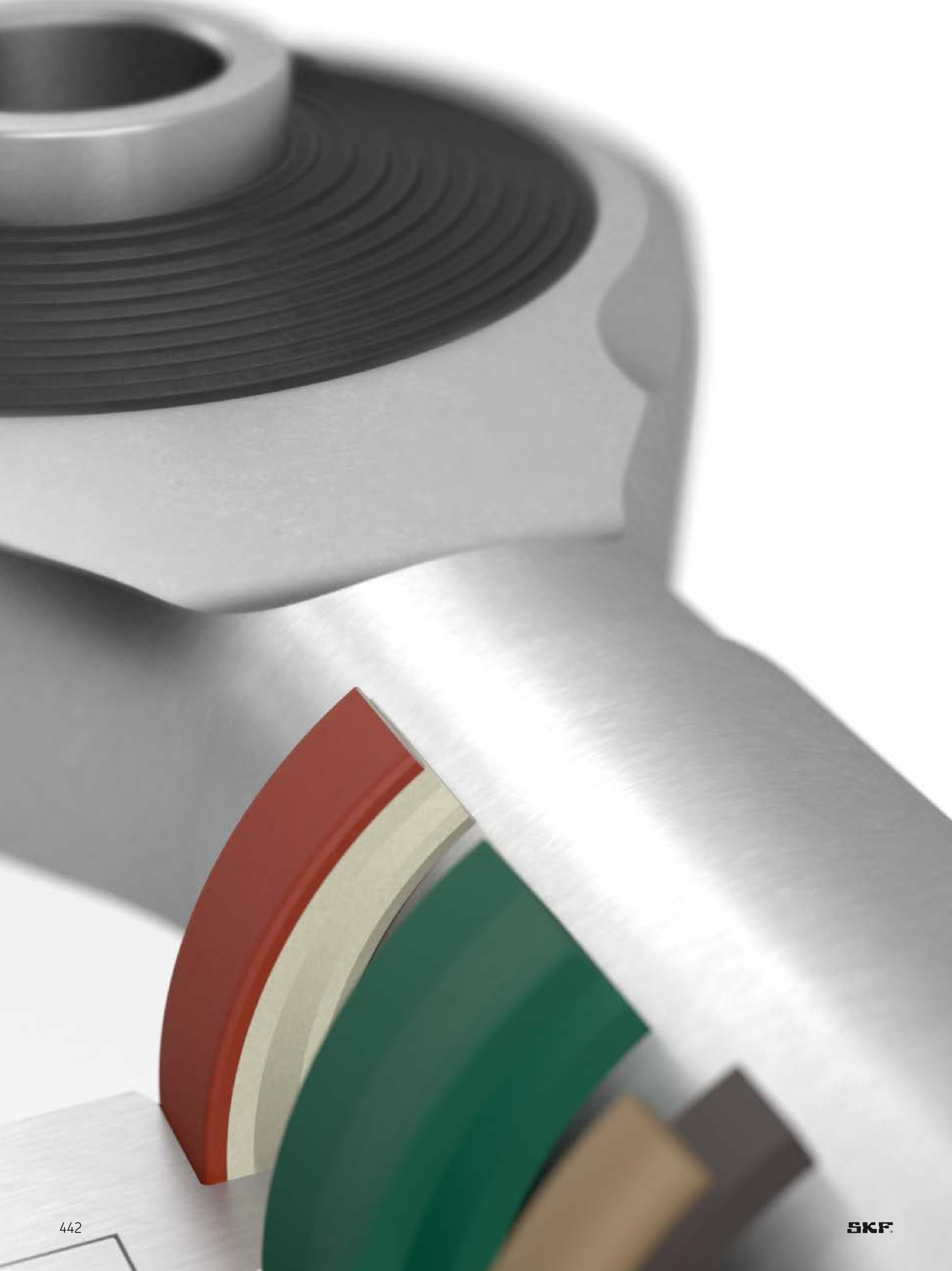
Beyond this limit, the ageing of the lubricant and of the packaging can lead to a reduced bearing protection and cause corrosion as well as bearing performance reduction. The bearing should therefore be inspected and reconditioned by SKF to increase the allowable storage time.

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.



C Other aerospace solutions

9

Aerospace thin section bearings

9 Aerospace thin section bearings

SKF Reali-Slim thin section bearings

SKF is a leading manufacturer of thin section bearings, including the standard SKF Reali-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 Reali-Slim products (**page 446**), SKF supplies both engineered designs (including SKF Ultra-Slim thin section bearings, see **page 451**) 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 451**).

For more information, go to: https://www.kaydonbearings.com/downloads/210-603-Kaydon_Reali-Slim_Bearing_Catalog_Apr-2020.pdf

Sizes

Each series of SKF Reali-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.

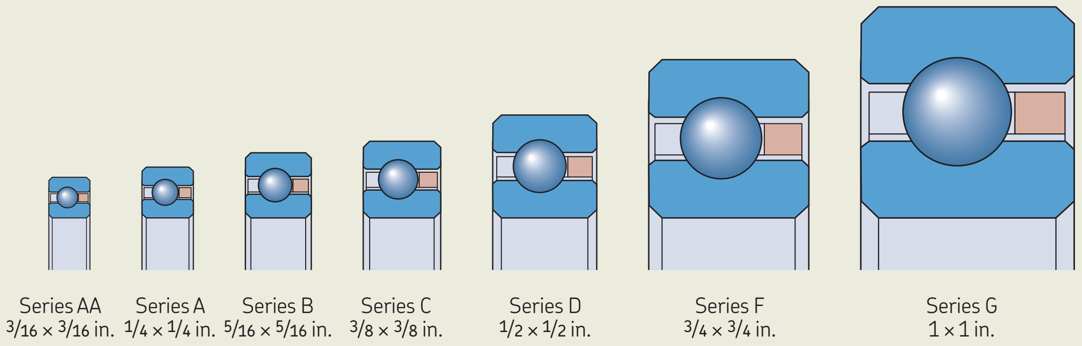
The inch dimensions family of SKF Reali-Slim bearings includes seven open series (**figure 1**) and five sealed series (**figure 2**), ranging from 1.000 to 40.000 in. *(25,4 to 1016,0 mm)* bore diameters. These series range from 0.187 x 0.187 in. *(4,7498 x 4,7498 mm)* to 1.000 x 1.000 in. *(25,4 x 25,4 mm)* cross section.

For applications requiring metric boundary dimensions or for dimensional interchangeability with other products, SKF supplies the SKF Reali-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

Inch bearings
Open



Bearing types and common design features overview

To support various load scenarios (radial, axial and moment load), SKF Reali-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 448**.

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 Reali-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 450** and **451**.

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 450**.

SKF Reali-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 449**.

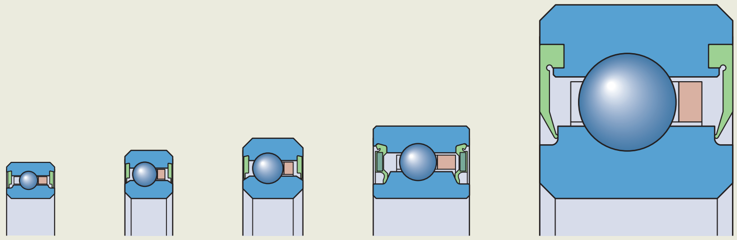
Bearings can be provided in a wide range of:

- 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 448** gives the key characteristics of the different types of SKF Reali-Slim bearings.

Figure 2

Inch bearings
Sealed



Series JHA
3/16 × 1/4 in.

Series JA
1/4 × 1/4 in.

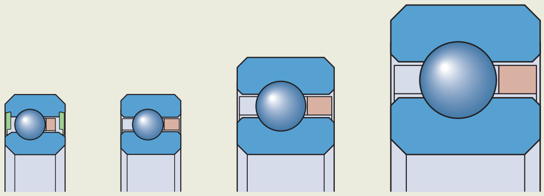
Series JB
5/16 × 5/16 in.

Series JU
1/2 × 3/8 in.

Series JG
1 × 1 in.

Figure 3

Metric bearings



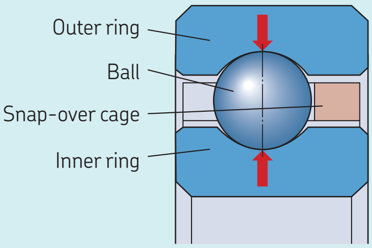
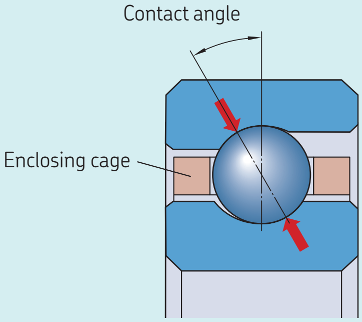
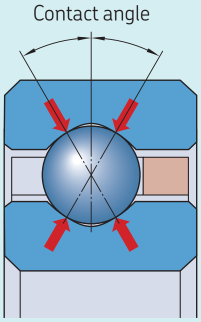
Sealed
8 × 8 mm

Open
8 × 8 mm

Open
13 × 13 mm

Open
20 × 20 mm

Table 1

Bearing types	Description
Radial contact bearing (Type C)  	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° 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

Figure 4

Continuous ring "Snap-over pocket" cage

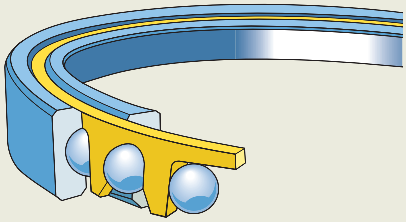


Figure 5

Continuous ring pocket cage

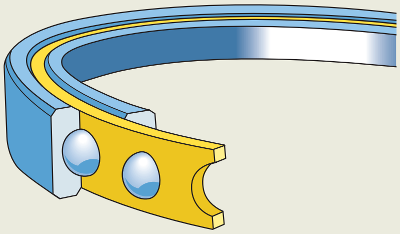


Figure 6

Riveted ring circular pocket cage

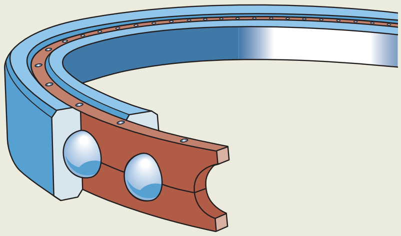


Figure 7

Formed wire cage

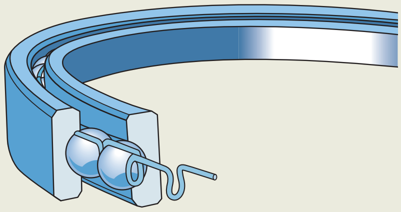


Figure 8

Toroid spacer

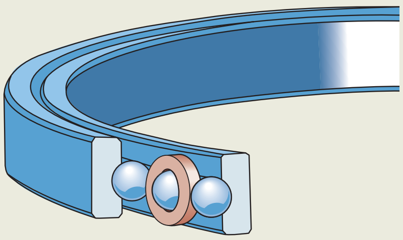


Figure 9

PTFE spacer slugs

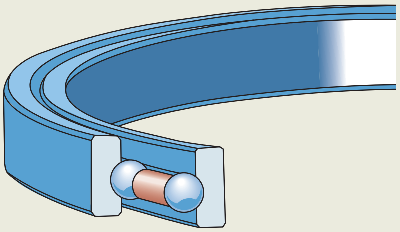


Figure 10

Spacer balls

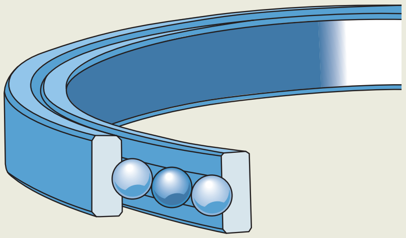
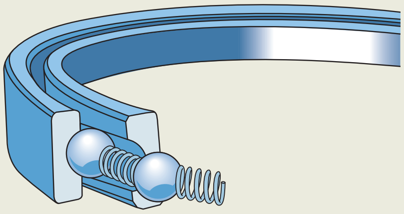


Figure 11

Helical spring



Sealing and shielding

For optimum performance of SKF Reali-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 Reali-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.

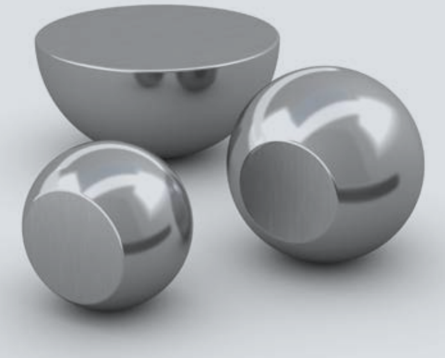
Hybrid bearings with ceramic balls are available on request. These are often used when lubrication is marginal or when lower wear generation and/or lower torque levels are required.

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

In addition to supplying precision aerospace specialty balls, typically used for rolling bearings (refer to *Airframe rolling bearings* **page 20** and *Aeroengine rolling bearings* **page 434**), 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 *(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 *(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 462**.

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**.

Figure 3

Ball plugs

Figure 4

Tooling and checking balls

Figure 5

Master ball set

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**
	µin./*µm*			
3	3/*0,08*	5/*0,13*	±30 *±0,75*	0.5/*0,012*
5	5/*0,13*	10/*0,25*	+50/–40 *+1,25/–1,00*	0.8/*0,020*
10	10/*0,25*	20/*0,50*	+50/–40 *+1,25/–1,00*	1.0/*0,025*
16	16/*0,40*	32/*0,80*	+50/–40 *+1,25/–1,00*	1.0/*0,025*
24	24/*0,60*	48/*1,20*	±100 *±2,50*	2.0/*0,050*
48	48/*1,20*	96/*2,40*	±200 *±5,00*	3.0/*0,080*
100	100/*2,50*	200/*5,00*	±500 *±12,50*	5.0/*0,125*
200	200/*5,00*	400/*10,00*	±1000 *±25,00*	8.0/*0,200*
500	500/*13,00*	1000/*25,00*	±2000 *±50,00*	– 1)
1000	1000/*25,00*	2000/*50,00*	±5000 *±125,00*	– 1)

1) Not applicable

11

Aerospace sealing solutions

11 Aerospace sealing solutions

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

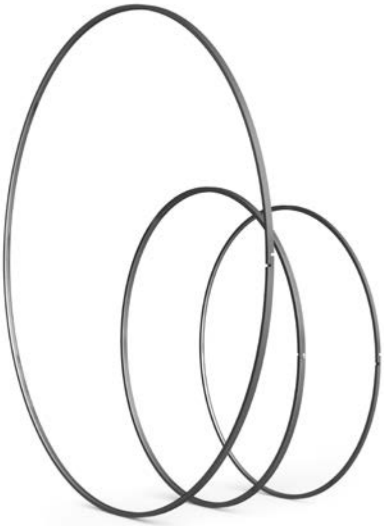
SKF is a major designer and manufacturer of sealing rings, used to meet the most demanding application requirements.
SKF sealing rings are specified for a broad range of static and dynamic aerospace applications including:

- Turbine engine bearing damper
- Piston engines
- Secondary seals in carbon seal assemblies
- Actuators
- Auxiliary power units (APU)
- Environmental control units
- High temperature valve applications

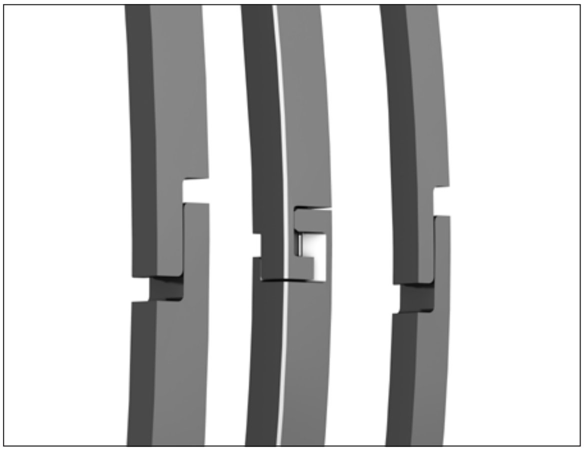
Patented joint configurations are available for applications requiring the strictest leakage control and for blind assembly applications. Various coatings are also used and are specified based on the needs of the application.

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 thermoplastic 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.

Carbon seals

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.

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 dismantling, 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

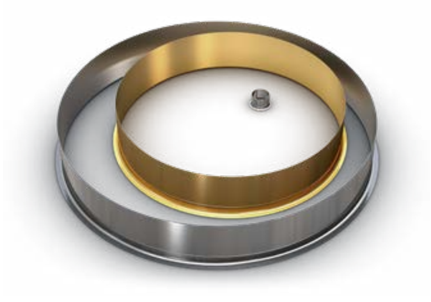
SKF Speedi-Sleeve Gold is an enhanced version of the standard SKF Speedi-Sleeve, offering improved resistance to abrasive wear. Designed for applications where extended sealing system life is needed, SKF Speedi-Sleeve Gold bridges the performance gap between the standard sleeve and expensive custom shaft 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.

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.

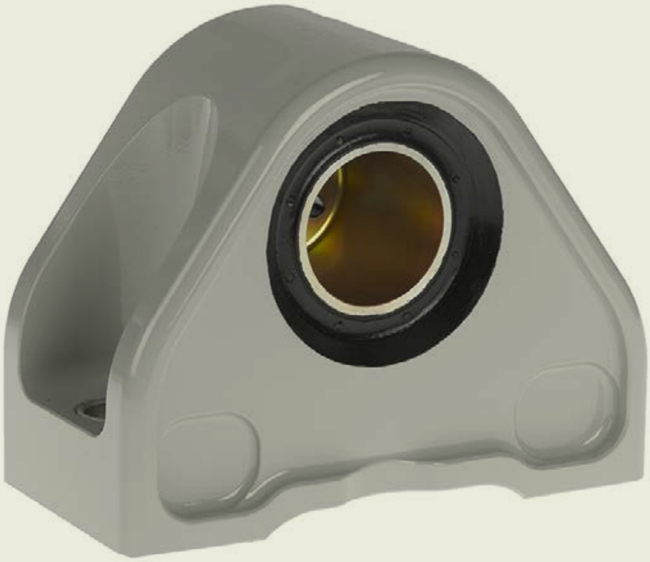
SKF Spectraseal

Rotary manifold seals

Locking T-seal

12

Aerospace elastomeric and damping solutions



12 Aerospace elastomeric and damping solutions

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

Table index

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Designation	Product	Product table	
		No.	Page[1]
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	**370**
EFJ/WQMT..R	For the bearing used in this rod end, see WQMT..		
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	**370**
EFJ/WQMTS..R	For the bearing used in this rod end, see WQMT..		
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	**300**
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	**290**
EMA..	For the bearing used in this rod end, see HMEN..R..		
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	**330**
EMJ/NAS..	For the bearing used in this rod end, see ENAS..		
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	**302**
EMJ/QML..	For the bearing used in this rod end, see QML..		
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	**364**
EMJ/QMLC..R	For the bearing used in this rod end, see QML..		
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	**364**
EMJ/QML..R	For the bearing used in this rod end, see QML..		

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EMJ/QMLS..R	For the bearing used in this rod end, see QML..		
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	**304**
EMJ/QMT..	For the bearing used in this rod end, see QMT..		
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	**366**
EMJ/QMTC..R	For the bearing used in this rod end, see QMT..		
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	**366**
EMJ/QMT..R	For the bearing used in this rod end, see QMT..		
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	**366**
EMJ/QMTS..R	For the bearing used in this rod end, see QMT..		
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	**292**
EMJ/RL..	For the bearing used in this rod end, see WEN..		
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	**336**
EMJ/RL..R..	For the bearing used in this rod end, see WAS..		
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	**294**
EMJ/RT..	For the bearing used in this rod end, see XRT..		

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Designation	Product	Product table No.	Page[1]
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	**338**
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	**326**
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	**302**
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	**364**
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	**364**
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	**364**
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	**304**
EMJ/WMT..	For the bearing used in this rod end, see WMT..		

Designation	Product	Product table No.	Page[1]
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	**366**
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	**366**
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	**366**
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	**302**
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	**364**
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	**364**
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	**364**
EMJ/WQMLS..R	For the bearing used in this rod end, see WQML..		

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Designation	Product	Product table No.	Page[1]
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	**368**
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	**310**
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	**310**
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	**370**
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	**370**
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	**370**
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	**296**
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	**298**
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	**362**
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	**340**
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	**308**
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	**308**
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	**368**
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	**368**
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	**368**
SEFJ/WMLS..R	For the bearing used in this rod end, see WML..		

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[1] Starting page of the product table.

Designation	Product	Product table	
		No.	Page[1]
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	**310**
SEFJ/WMT..	For the bearing used in this rod end, see WMT..		
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	**310**
SEFJ/WMT..	For the bearing used in this rod end, see WMT..		
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	**370**
SEFJ/WMTC..R	For the bearing used in this rod end, see WMT..		
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	**370**
SEFJ/WMT..R	For the bearing used in this rod end, see WMT..		
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	**370**
SEFJ/WMTS..R	For the bearing used in this rod end, see WMT..		
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	**308**
SEFJ/WQML..	For the bearing used in this rod end, see WQML..		
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	**308**
SEFJ/WQML..	For the bearing used in this rod end, see WQML..		

Designation	Product	Product table	
		No.	Page[1]
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	**368**
SEFJ/WQMLC..R	For the bearing used in this rod end, see WQML..		
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	**368**
SEFJ/WQML..R	For the bearing used in this rod end, see WQML..		
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	**368**
SEFJ/WQMLS..R	For the bearing used in this rod end, see WQML..		
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	**310**
SEFJ/WQMT..	For the bearing used in this rod end, see WQMT..		
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	**310**
SEFJ/WQMT..	For the bearing used in this rod end, see WQMT..		
SEFJ/WQMTC..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	**370**
SEFJ/WQMTC..R	For the bearing used in this rod end, see WQMT..		
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	**370**
SEFJ/WQMT..R	For the bearing used in this rod end, see WQMT..		

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[1] Starting page of the product table.

Designation	Product	Product table No.	Page[1]
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	**370**
SEFJ/WQMTS..R	For the bearing used in this rod end, see WQMT..		
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	**300**
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	**290**
SEMA..	For the bearing used in this rod end, see HMEN..R..		
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	**330**
SEMJ/NAS..	For the bearing used in this rod end, see ENAS..		
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	**302**
SEMJ/QML..	For the bearing used in this rod end, see QML..		
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	**302**
SEMJ/QML..	For the bearing used in this rod end, see QML..		
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	**364**
SEMJ/QMLC..R	For the bearing used in this rod end, see QML..		
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	**364**
SEMJ/QML..R	For the bearing used in this rod end, see QML..		
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	**364**
SEMJ/QMLS..R	For the bearing used in this rod end, see QML..		
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	**304**
SEMJ/QMT..	For the bearing used in this rod end, see QMT..		
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	**304**
SEMJ/QMT..	For the bearing used in this rod end, see QMT..		
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	**366**
SEMJ/QMTC..R	For the bearing used in this rod end, see QMT..		
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	**366**
SEMJ/QMT..R	For the bearing used in this rod end, see QMT..		
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	**366**
SEMJ/QMTS..R	For the bearing used in this rod end, see QMT..		
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	**292**
SEMJ/RL..	For the bearing used in this rod end, see WEN..		
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	**336**
SEMJ/RL..R..	For the bearing used in this rod end, see WAS..		

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Designation	Product	Product table No.	Page[1]
SKP..LSP..	Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, sealed	1.17	**80**
SKP..PSP..	Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, shielded	1.17	**80**
SKP..SP..	Airframe rolling bearings – Deep groove ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, sealed	1.17	**80**
SKSP..	Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance	1.23	**96**
SKSP..A	Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance	1.23	**96**
SKSP..APSP..	Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, shielded	1.24	**100**
SKSP..ASP..	Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, sealed	1.24	**100**
SKSP..L	Airframe rolling bearings – Self-aligning ball bearing single row, AS 27645 (inch dimensions), zinc-nickel plated bearing steel, standard tolerance	1.23	**96**
SKSP..PSP..	Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, shielded	1.24	**100**
SKSP..SP..	Airframe rolling bearings – Self-aligning ball bearing single row (inch dimensions), zinc-nickel plated bearing steel, sealed	1.24	**100**
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	**82**
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	**88**
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	**104**
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	**90**
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	**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	**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	**330**
SMJ/NAS..	For the bearing used in this rod end, see NAS..		
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	**326**
SMJ/WAS..	For the bearing used in this rod end, see WAS..		
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	**68**
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	**70**
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	**74**
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	**92**
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	**68**
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	**96**
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	**96**
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	**96**
SN..	Airframe spherical plain bearings – Self-lubricating narrow, NSA 8134, NSA 8136 (inch dimensions)	2.25	**222**
SN..ZT..	Airframe spherical plain bearings – Self-lubricating narrow controlled clearance (inch dimensions)	2.24	**220**

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Designation	Product	Product table No.	Page[1]
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	**92**
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	**68**
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	**96**
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	**96**
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	**96**
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	**166**
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	**184**
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	**170**
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	**192**
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	**172**
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	**200**
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	**158**
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	**162**
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	**176**
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	**166**
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	**184**
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	**170**
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	**192**
SZWT..	Airframe rolling bearings – Deep groove ball bearing single row (metric dimensions), zinc-nickel plated corrosion-resistant-steel	1.3	**46**
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	**288**
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	**288**
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	**286**
SZXCN..-..	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	**316**
SZXCN..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	**316**

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Designation	**Product**	**Product table**	
		No.	Page[1]
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	**368**
TEFJ/WQMLC..R	For the bearing used in this rod end, see WQML..		
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	**368**
TEFJ/WQML..R	For the bearing used in this rod end, see WQML..		
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	**368**
TEFJ/WQMLS..R	For the bearing used in this rod end, see WQML..		
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	**310**
TEFJ/WQMT..	For the bearing used in this rod end, see WQMT..		
TEFJ/WQMTC..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	**370**
TEFJ/WQMTC..R	For the bearing used in this rod end, see WQMT..		
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	**370**
TEFJ/WQMT..R	For the bearing used in this rod end, see WQMT..		
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	**370**
TEFJ/WQMTS..R	For the bearing used in this rod end, see WQMT..		
TEMA..	Airframe rod ends – External thread inserted self-lubricating spherical plain bearing rod end (metric dimensions), anodized titanium rod end	3.3	**290**
TEMA..	For the bearing used in this rod end, see HMEN..R..		
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	**302**
TEMJ/QML..	For the bearing used in this rod end, see QML..		
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	**364**
TEMJ/QMLC..R	For the bearing used in this rod end, see QML..		
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	**364**
TEMJ/QML..R	For the bearing used in this rod end, see QML..		
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	**364**
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	**304**
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	**366**
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	**366**
TEMJ/QMT..R	For the bearing used in this rod end, see QMT..		

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Designation	Product	Product table No.	Page[1]
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	**366**
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	**292**
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	**336**
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	**294**
TEMJ/RT..	For the bearing used in this rod end, see XRT..		
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	**338**
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	**302**
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	**364**
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	**364**
TEMJ/WML..R	For the bearing used in this rod end, see WML..		
TEMJ/WMLS..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	**364**
TEMJ/WMLS..R	For the bearing used in this rod end, see WML..		
TEMJ/WMT..	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	**304**
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	**366**
TEMJ/WMTC..R	For the bearing used in this rod end, see WMT..		
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	**366**
TEMJ/WMT..R	For the bearing used in this rod end, see WMT..		
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	**366**
TEMJ/WMTS..R	For the bearing used in this rod end, see WMT..		
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	**302**
TEMJ/WQML..	For the bearing used in this rod end, see WQML..		
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	**364**
TEMJ/WQMLC..R	For the bearing used in this rod end, see WQML..		

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Designation	Product	Product table No.	Page1)
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	**370**
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	**300**
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	**290**
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	**364**
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	**364**
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	**364**
XEMJ/QMLS..R	For the bearing used in this rod end, see QML..		
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	**366**
XEMJ/QMTC..R	For the bearing used in this rod end, see QMT..		
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	**366**

Designation	Product	Product table No.	Page1)
XEMJ/QMT..R	For the bearing used in this rod end, see QMT..		
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	**366**
XEMJ/QMTS..R	For the bearing used in this rod end, see QMT..		
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	**292**
XEMJ/RL..	For the bearing used in this rod end, see WEN..		
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	**336**
XEMJ/RL..R..	For the bearing used in this rod end, see WAS..		
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	**294**
XEMJ/RT..	For the bearing used in this rod end, see XRT..		
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	**338**
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	**364**
XEMJ/WMLC..R	For the bearing used in this rod end, see WML..		
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	**364**
XEMJ/WML..R	For the bearing used in this rod end, see WML..		
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	**364**
XEMJ/WMLS..R	For the bearing used in this rod end, see WML..		

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