# SKF sealed high precision angular contact ball bearings for enhanced performance and extended service life



**Made by SKF** stands for excellence. It symbolises our consistent endeavour to achieve total quality in everything we do. For those who use our products, “Made by SKF” implies three main benefits.

**Reliability** – thanks to modern, efficient products, based on our worldwide application know-how, optimised materials, forward-looking designs and the most advanced production techniques.

**Cost effectiveness** – resulting from the favourable ratio between our product quality plus service facilities, and the purchase price of the product.

**Market lead** – which you can achieve by taking advantage of our products and services. Increased operating time and reduced downtime, as well as improved output and product quality are the key to a successful partnership.




# Contents

**1 Product information**

**Selection of bearing type ..... 3**
Why use SKF sealed high-precision angular contact ball bearings? ..... 3
Advantages and benefits ..... 4
Seal design ..... 4
A wide assortment ..... 6
The range ..... 8

**2 Recommendations**

**Selection of bearing size ..... 10**
General ..... 10
Bearing life ..... 11
Equivalent bearing load ..... 12

**Service for a lasting partnership ..... 13**

**Applications ..... 14**

**3 Product data**

**General bearing data ..... 16**
Dimensions ..... 16
Tolerances ..... 16
Preload ..... 19
Material ..... 21
Cages ..... 21
Speed ..... 21
Greases ..... 21
Designation systems ..... 22
Product tables ..... 24

**Other SKF products and services ..... 40**

**The SKF Group ..... 42**

# Selection of bearing type

## Why use SKF sealed high-precision angular contact ball bearings?

Today's machine tools must be designed for long service, high reliability and extremely high cutting speeds to meet the stringent demands for increased productivity from end users. Bearings, although hidden from view, play a critical role in the performance of machine tool spindles, the heart of the machine.

Bearing systems may fail for many reasons (➔ **diagram** 1). Field analysis has shown that 15% of premature loss of performance is due to contamination from particles and fibers entering the area where rolling contact takes place. Another 15% of bearings fail prematurely because of lubrication problems, such as loss of lubricant, polluted lubricant, incorrect type of lubricant or quantity.

The balance of premature failures can be attributed to mechanical problems, such as mounting errors, misalignment, excessive loading and corrosion.

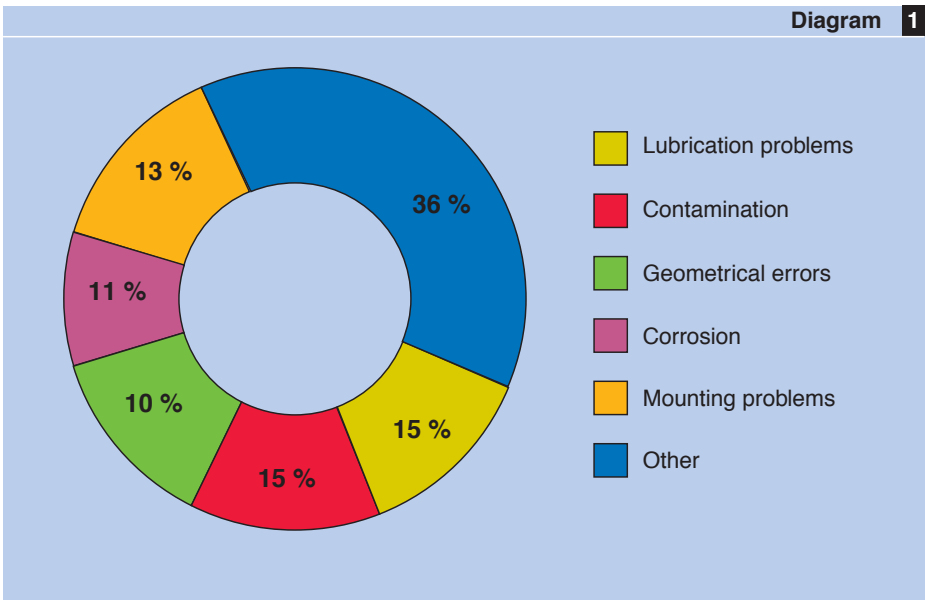
Bearing contamination can also be caused by spindle exposure to pollution from high-pressure cutting fluid spray near the spindle nose in metal cutting machines or by fine dust spreading around the machine in woodworking applications.

Although spindles are generally designed with sealing systems, sometimes these systems might not be sufficient to avoid bearing contamination. With today's high production requirements, unplanned downtime is extremely expensive, so products that can contribute to machine uptime offer a big advantage.

SKF's new sealed high-precision angular contact ball bearings are the answer for all high-precision application areas where contamination and/or grease retention problems prevent achieving optimum machining performance.

***Major causes of bearing failure.***

**Diagram 1**



# Advantages and benefits

SKF's range of sealed ball bearings offer a number of advantages and benefits. Sealed bearings can operate in contaminated environments like woodworking shops and prevent undesired particles from getting inside the bearings. In vertical spindle applications, sealed bearings can improve grease retention, drastically reducing lubrication problems. Sealed bearings are ready-to-mount units, so assembly time is reduced. The most important advantages of using sealed high-precision angular contact ball bearings are summarised in **table** 1.

# Seal design

Having worked with all types of spindle and bearing applications worldwide, SKF has unrivalled experience when it comes to designing and manufacturing sealed bearings. After listening to customer needs, SKF developed this new series of sealed high-precision angular contact ball bearings. The new seal design has high-speed capability, ensures efficient sealing and grease retention, and has the lowest possible temperature rise.

To achieve optimum performance, a low-friction seal made of oil and wear-resistant NBR (nitrile rubber) with sheet steel reinforcement was designed.

**Table** 2 shows a comparison of performance among three basic sealing solutions: non-contacting shields, low-friction seals and contacting seals. Low-friction seals used in SKF high-precision angular contact ball bearings provide excellent speed capability, good grease retention and good dust exclusion.

Although contacting seals provide the best results in terms of preventing contamination, they are not suitable for tangential speeds the seals would encounter in machine tool spindle applications.

For more demanding applications, high-precision angular contact ball bearings fitted with fluoro rubber (FPM) seals can be supplied on request.

Please, consult SKF for technical details and availability.

**Table 1**

| Design concept | Advantages | Benefits |
|---|---|---|
| Low friction seal design on both side of the bearing | High rotational speed (up to 1,6 x$10^6$ n x $d_m$) and low temperature rise | High performance and good thermal stability |
| | Grease retention, preventing lubrication problems | Longer service life |
| | Efficient sealing against contaminants | Longer service life |
| Improved cage design | Optimum grease distribution | Short running-in |
| Pre-greased for life | Precise grease quantity | High speed |
| | Eliminate risk of incompatibility between greases and washing fluids | Longer service life |
| | Avoid possible contamination during spindle mounting | Longer service life |
| | Do not need re-greasing | Reduced maintenance |
| | Ready-to-mount unit | Reduced mounting time |
| Specific high speed grease | High rotational speed | Higher productivity |

**Diagram** 2 shows the results of extensive laboratory and field tests carried out on sealed high-precision angular contact ball bearings.

***Comparison of performance for different seal designs.***

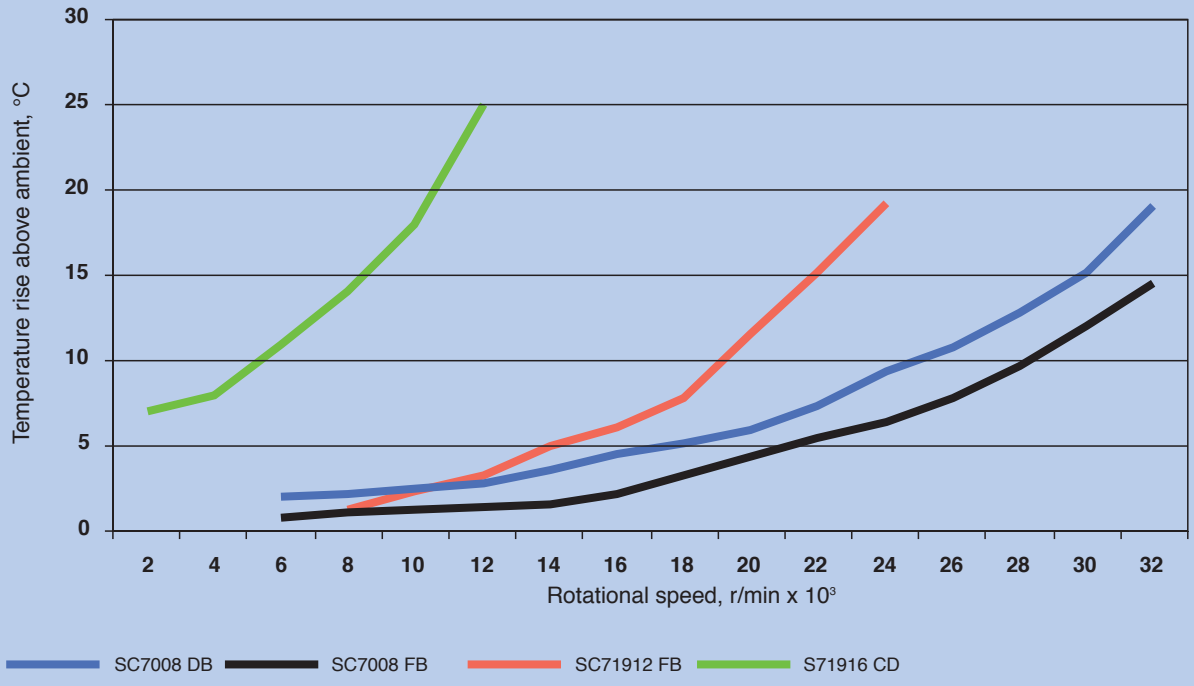
**Table 2**

| Design | Speed capability | Low friction torque | Grease retention | Dust exclusion | Static water exclusion | Dynamic water exclusion |
|---|---|---|---|---|---|---|
| **Shields** | ooooo | ooooo | o | oo | o | o |
| **Low friction seals** | ooooo | ooooo | oooo | oooo | oo | o |
| **Contacting seals** | ooo | o | ooooo | ooooo | ooooo | ooo |

ooooo excellent  oooo very good  ooo good  oo acceptable  o not recommended

***Temperature rise for different bearing designs -*** *Grease lubrication.*

**Diagram 2**



# A wide assortment

## Five different designs

SKF sealed high-precision angular contact ball bearings are available in two dimension series (➔ **fig** 1): bearing series 719 and 70 with a contact angle of 15° (designation suffix CD and CB), 18° (designation suffix FB), 25° (designation suffix ACD and DB) (➔ **fig** 2). Bearings of series 719 CB and 70 CB are supplied on request. Please contact SKF for availability.

Bearings with the greater contact angle are recommended for applications where high axial stiffness and high axial load carrying capacity are required.

Clearly the space requirements are different and arrangements can be more or less radially compact. For higher speeds or where little radial space is available, bearings of series 719 should be chosen.

For higher loads, bearings of series 70 are more appropriate.

## Standard sealed high-precision angular contact ball bearings

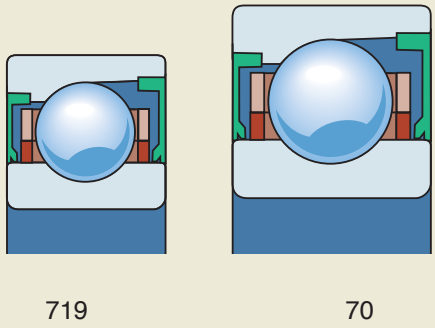
SKF's standard sealed high-precision angular contact bearings represent the best solution in terms of load-carrying capacity, rigidity and speed. These sealed high-precision angular contact ball bearings have one reduced height flange on the outer ring to allow for the introduction of a large number of balls by using a one-piece cage and an optimized internal design.

The bearings are manufactured according to both the 719 and 70 series with a choice of two different contact angles: 15° (designation suffix CD) or 25° (designation suffix ACD). Two low-friction seals are mounted on both sides.

Dimensions and technical data are given in the relevant product tables. The designation scheme of SKF sealed high-precision angular contact ball bearings is shown in **table** 6 **page 23.**

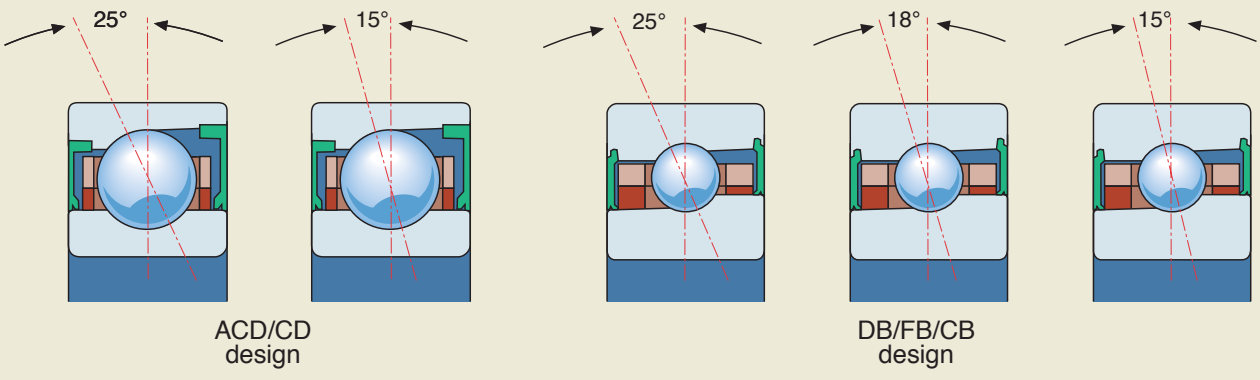
***Cross section of the two series***

Fig 1




***Different designs of SKF sealed high-precision angular contact ball bearings***

Fig 2



## High-speed sealed high-precision angular contact ball bearings

In addition to its standard series of sealed high-precision angular contact ball bearings, SKF also offers a range of bearings to meet the highest demands for speed and running accuracy.

The high-speed sealed high-precision angular contact ball bearing design (designation suffix FB, CB and DB) have a larger number of smaller diameter balls compared with the standard CD and ACD design. Centrifugal force from contact between the balls and the outer-ring raceway is therefore further reduced, as is contact pressure. Because of their smaller diameter, balls of the high-speed design bearings occupy less of the bearing cross-section, so the rings are correspondingly thicker. This means that any dimensional errors of a shaft or housing bore have less influence on the roundness of the bearing rings, so as a result, running accuracy is enhanced.

The bearings belonging to series 719 FB (CB, DB) and 70 FB (CB, DB) are characterized by the following features:

- smaller balls
- contact angle of 18°, 15° or 25°
- both outer-ring and inner-ring shoulders of reduced height for better lubrication conditions
- outer-ring centered cage
- optimum internal design for enhanced speed capability
- extremely high running accuracy.

Technical data and dimensions are in corresponding product tables.

The designation scheme of SKF sealed high-speed high-precision angular contact ball bearings is in **table** 6 **page 23.**

## Hybrid sealed high-precision angular contact ball bearings

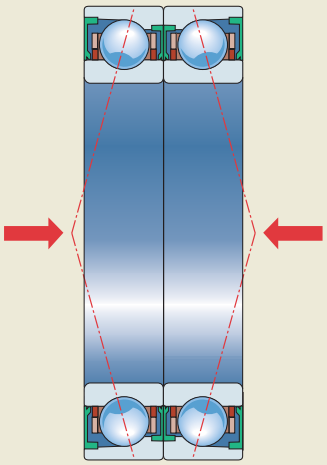
Hybrid sealed high-precision angular contact ball bearings are offered in the same specifications as all-steel sealed high-precision angular contact ball bearing series 719 CD (ACD) and 70 CD (ACD).

Hybrid bearings are identified by the suffix HC in designations, e.g., S7014 CDGA/HCP4A.

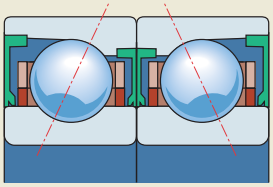
## Hybrid high-speed high-precision angular contact ball bearings

For even more demanding applications, SKF offers hybrid high-speed sealed high-precision angular contact ball bearings. The series, 719 FB (CB, DB) and 70 FB (CB, DB), under proper lubrication conditions and with moderate loading, can reach rotational speeds up to 1,6 million n x $d_m$. Hybrid high-speed bearings are identified by the prefix C, e.g., SC7014 FBGA/P7.

Fig 3

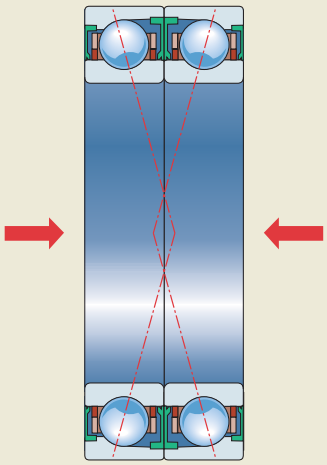


Back-to-back arrangement
for axial load in both directions

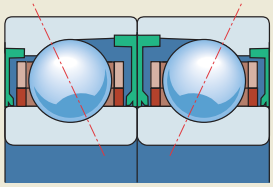


Back-to-back arrangement
Designation suffix DB

Fig 4

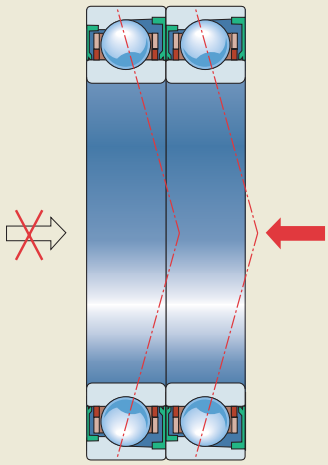


Face-to-face arrangement
for axial load in both directions

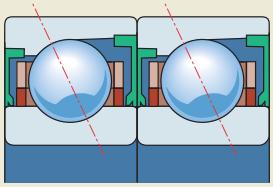


Face-to-face arrangement
Designation suffix DF

Fig 5



Tandem arrangement
for axial load in one direction



Tandem arrangement
Designation suffix DT

# The Range

SKF's standard range of sealed high-precision angular contact ball bearings is available in bore diameters from 30 to 120 mm for CB, FB and DB designs and in bore diameters from 30 to 150 mm for CD and ACD designs.

Sealed high-precision angular contact ball bearings can be supplied as single bearings or for paired mounting in sets.

Details concerning technical data and availability of other sizes will be supplied upon request.

## Universally matchable bearings

A special type of bearing for paired mounting is available from SKF. These are "universal bearings" specially matched during manufacture to be mounted against each other in any arrangement depending on the application (e.g., back-to-back, face-to-face or tandem in groups of two or more bearings). The designations for single universally matchable bearings are explained in **table** 3.

Basic features such as accuracy, preload class, speed capability, etc. are the same as those of the pre-matched sets. Universal bearings can be supplied in two basic types: single universal bearings for mounting in any combination, or duplex sets with matched bore and outside diameter.

Customers need to order the same number of single universal bearings as the number of bearings in a set. For example, to replace a set of S7014 CD/P4ATBTA, three bearings S7014 CDGA/P4A are required.

Likewise, two universal bearings are needed to replace a duplex set. Duplex universal bearings can either be used as sets, or each bearing used to form other groups of bearings, the only limitation being the contact angle and the preload class. Universal bearings with a given preload must not be paired against bearings with a different contact angle or preload class. For such special cases, please consult the SKF application engineering service.

Universally matchable bearings may be useful in reducing stock levels and improving availability. Several specific matched sets may be obtained by stocking the correct universal bearings.

## Matched bearing sets

SKF sealed high-precision angular contact ball bearings are also available as complete sets of two, three or four bearings. They are matched in manufacturing so that when the bearings are mounted immediately next to each other, the predetermined value of the preload will be obtained, or the load will be evenly distributed. The bore and outside diameters will not differ by more than one-third of the permissible diameter tolerance.

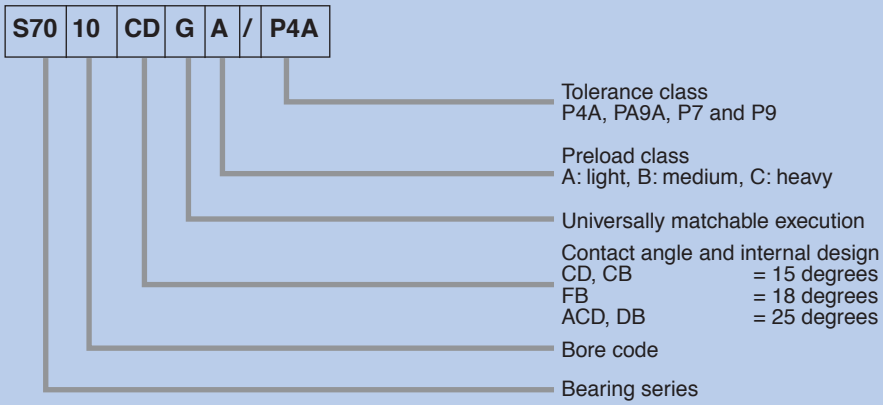
**Back-to-back arrangement DB**
The load lines of bearings arranged back-to-back diverge toward the bearing axis (➔ **fig** 3 **page 7**). Axial loads can be accommodated in both directions, although only by one bearing, or bearings in tandem, at a time. The back-to-back arrangement is relatively stiff and can also take up tilting moments.

**Face-to-face arrangement DF**
The load lines of bearings arranged face-to-face converge towards the bearing axis (➔ **fig** 4 **page 7**).

Axial loads can be accomodated in both directions, although only by one

***Designation of single universal sealed high-precision angular contact ball bearings***

**Table** 3




See Table 6 page 23 for more details

bearing (or bearings in tandem) at a time. The arrangement is not so stiff as the back-to-back arrangement and is less suitable for tilting moments.

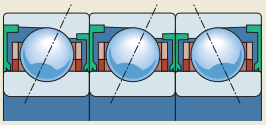
**Tandem arrangement DT**
In a tandem arrangement (**fig 5 page 7**), the load lines of the bearings are parallel. Radial and axial loads are equally distributed over the bearings, but axial loads can only be carried in one direction.

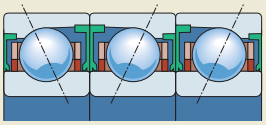
A set of bearings in a tandem arrangement is therefore generally adjusted against another bearing that can take the axial loads acting in the opposite direction.

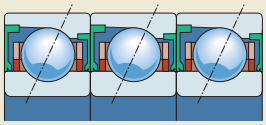
**Other bearing arrangements**
The various bearing combinations shown are those most commonly used (**fig 6**). However, SKF can also provide combinations of more bearings upon request.

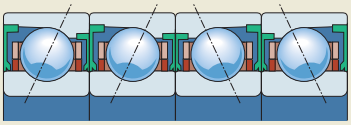
Combinations of tandem and back-to-back or tandem and face-to-face are normally used when the design calls for enhanced performance in terms of load capacity or rigidity.

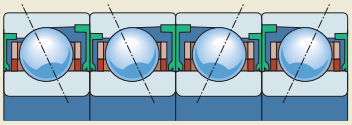
**Fig 6**

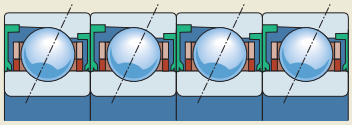

Combination of tandem and back-to-back arrangement
Designation suffix TBT

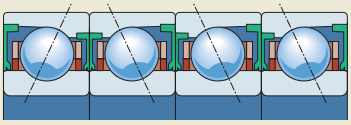

Combination of tandem and face-to face arrangement
Designation suffix TFT

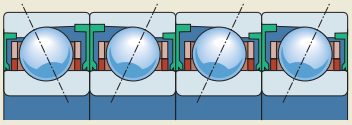

Tandem arrangement
Designation suffix TT


Combination of tandem and back-to-back arrangement
Designation suffix QBC


Combination of tandem and face-to face arrangement
Designation suffix QFC


Tandem arrangement
Designation suffix QT


Combination of tandem and back-to-back arrangement
Designation suffix QBT


Combination of tandem and face-to face arrangement
Designation suffix QFT

# Selection of bearing size

## General

All general information on life, basic load rating, and life equations described in the SKF General Catalogue or the SKF Interactive Engineering Catalogue also applies to sealed high-precision angular contact ball bearings.

In general-machinery applications, the size of bearing to be used is initially selected on the basis of its load carrying capacity in relation to the loads to be carried, and the requirements regarding life and reliability.

For machine tool spindles, bearing size is nearly always determined by criteria such as stiffness of the system, fixed dimensions for the tool holder, or the spindle bore. The bearings selected according to such criteria give arrangements that are often required to have a very long life.

For sealed high-precision angular contact ball bearings, determining the load to which a bearing will be subjected is particularly complex as it involves many influencing factors. SKF has therefore developed special computer programs for the calculation of indeterminate spindle bearing systems. Contact SKF for assistance in determining the bearing loads and in designing an optimum bearing arrangement.



# Bearing life

For calculation of simple bearing systems, the classic ISO equation for basic rating life can be used:

$L10 = (C/P)^p$

where
$L_{10}$ = basic rating life, millions of revolutions
C = basic dynamic load rating, N
P = equivalent dynamic bearing load, N
p = exponent of the life equation (3 for ball bearings)

As there are many other factors influencing bearing life besides load, ISO introduced an adjusted life equation

$L_{na} = a_1\, a_2\, a_3\, (C/P)^p$

or simply $L_{na} = a_1\, a_2\, a_3\, L_{10}$

where
$L_{na}$ = adjusted rating life millions of revolutions (the index n represents the difference between the requisite reliability and 100%)
$a_1$ = life adjustment factor for reliability
$a_2$ = life adjustment factor for material
$a_3$ = life adjustment factor for operating conditions

Practical experience and modern research have shown that, under special conditions, SKF bearings attain a much longer life than predicted by standardised life calculation methods, particularly when loads are light. These special conditions apply when the rolling surfaces (raceways and rolling elements) are effectively separated by a lubricant film, and where the risk of the surfaces becoming damaged by contaminants are largely non-existent. In fact, under ideal conditions it is possible to speak of infinite life.

The SKF Life Theory introduces the concept of a fatigue load limit Pu analogous to that used when calculating other machinery components. This fatigue load limit represents the load below which fatigue will not occur in the bearing under ideal conditions. Due to the complexity, a detailed description of the theory is beyond the scope of this publication. For further details, please consult SKF application engineering services.

Values of the Pu limit for sealed high-precision angular contact ball bearings are given in the bearing tables. The adjusted life equation according to the SKF Life Theory is:

$L_{naa} = a_1\, a_{SKF}\, L_{10}$

where:
$L_{naa}$ = adjusted rating life to SKF Life Theory, millions of revolutions
$L_{10}$ = basic rating life, millions of revolutions
$a_1$ = life adjustment factor for reliability
$a_{SKF}$ = life adjustment factor based on SKF Life Theory

For details on the aSKF life adjustment factor, please consult the SKF General Catalogue or the SKF Interactive Engineering Catalogue.

When using hybrid bearings, the effect of the different rolling element material should also be taken into account.

Under the same external load, the stress in the contact area between a hybrid bearing ball and each raceway will be higher than in an all-steel bearing. This is due to the greater hardness and stiffness of the ceramic material compared with steel.

As ISO does not provide guidelines for calculating basic load ratings for hybrid bearings, SKF quotes the same load rating values for hybrid bearings as for all-steel bearings.

By introducing a factor $a_{HC}$ into the life equations, the higher contact stress is taken into consideration.

$L_{10\ (hybrid)} = a_{HC}\, (C/P)^p$
$L_{na\ (hybrid)} = a_1\, a_{23}\, a_{HC}\, (C/P)^p$
$L_{naa\ (hybrid)} = a_1\, a_{SKF}\, a_{HC}\, (C/P)^p$

Recent results from practical experience and extensive laboratory testing indicate that the factor aHC can be considered equal to 1 for hybrid ball bearings.

In general, experience shows that the service life of hybrid bearings is significantly longer than that of all-steel bearings under the conditions normally encountered in machine tool operations. Hybrid bearings are much less susceptible to wear, and lubrication conditions are generally superior to those in an all-steel bearing.

# Equivalent bearing load

## Equivalent dynamic bearing load

For bearings arranged singly or paired in tandem:

$P = F_r$ when $F_a/F_r \leq e$
$P = X F_r + Y F_a$ when $F_a / F_r > e$

Factor values are given in **table 1**. When calculating bearing pairs, Fr and Fa represent the forces acting on the bearing pair.

For bearings paired back-to-back or face-to-face:

$P = F_r + Y_1 F_a$ when $F_a / F_r \leq e$
$P = X F_r + Y_2 F_a$ when $F_a / F_r > e$

Factor values are given in **table 2**. When calculating bearing pairs, $F_r$ and $F_a$ represent the forces acting on the bearing pair.

## Equivalent static bearing load

For bearings arranged singly or paired in tandem:

$P_0 = 0{,}5 F_r + Y_0 F_a$

when $P_0 < F_r$, $P_0 = F_r$ should be used.

For bearings paired back-to-back or face-to-face:

$P_0 = F_r + Y_0 F_a$

The value of factor $Y_0$ depends on the contact angle and can be obtained from **table 1** and **table 2**. When calculating bearing pairs, $F_r$ and $F_a$ are the forces acting on the bearing pair.

For hybrid bearings, the same basic static load ratings as for all-steel bearings are valid if compensated for by the different values of the static safety factor $s_0$, where $s_0 = C_0/P_0$.

Vibration from other machinery, traffic or shipping might cause damage to bearings. In such cases, bearing life is not limited by the material fatigue but by the permanent deformation produced in the contact between balls and raceways. A ball might be driven into the surface of the rings by the applied load. The same might happen for bearings sustaining heavy shock loads during a fraction of a revolution.

For long life and high performance, permanent deformation of the bearing parts should be avoided at all costs. The maximum load should therefore not exceed the equivalent static load obtained from the equation:

$P_0 = C_0/s_0$

where:

$P_0$ = equivalent static bearing load, N
$C_0$ = basic static load rating, N
$s_0$ = static safety factor

For all-steel sealed high-precision angular contact ball bearings, a minimum safety factor $s_0$ of 3 is recommanded. For hybrid bearings a safety factor $s_0$ of 3,4 can be used.

***Calculation factors for single bearings and bearings paired in tandem***

**Table 1**

| $f_0 F_a/C_0$ [1] | e | X | Y | $Y_0$ |
|---|---|---|---|---|
| **Contact angle 15/18 degrees (suffix CD, CB and FB)** | | | | |
| < 0.178 | 0.38 | 0.44 | 1.47 | 0.46 |
| 0.357 | 0.4 | 0.44 | 1.40 | 0.46 |
| 0.714 | 0.43 | 0.44 | 1.30 | 0.46 |
| 1.07 | 0.46 | 0.44 | 1.23 | 0.46 |
| 1.43 | 0.47 | 0.44 | 1.19 | 0.46 |
| 2.14 | 0.5 | 0.44 | 1.12 | 0.46 |
| 3.57 | 0.55 | 0.44 | 1.02 | 0.46 |
| 5.35 | 0.56 | 0.44 | 1.00 | 0.46 |
| > 7.14 | 0.56 | 0.44 | 1.00 | 0.46 |
| **Contact angle 25 degrees (suffix ACD, DB)** | | | | |
| – | 0.68 | 0.41 | 0.87 | 0.38 |

[1] Values of $f_0$ are given in the bearing tables

***Calculation factors for bearings paired back-to-back or face-to-face***

**Table 2**

| $2f_0 F_a/C_0$ [1] | e | X | $Y_1$ | $Y_2$ | $Y_0$ |
|---|---|---|---|---|---|
| **Contact angle 15/18 degrees (suffix CD, CB and FB)** | | | | | |
| < 0.178 | 0.38 | 0.72 | 1.65 | 2.39 | 0.92 |
| 0.357 | 0.4 | 0.72 | 1.57 | 2.28 | 0.92 |
| 0.714 | 0.43 | 0.72 | 1.46 | 2.11 | 0.92 |
| 1.07 | 0.46 | 0.72 | 1.38 | 2.00 | 0.92 |
| 1.43 | 0.47 | 0.72 | 1.34 | 1.93 | 0.92 |
| 2.14 | 0.5 | 0.72 | 1.26 | 1.82 | 0.92 |
| 3.57 | 0.55 | 0.72 | 1.14 | 1.66 | 0.92 |
| 5.35 | 0.56 | 0.72 | 1.12 | 1.63 | 0.92 |
| > 7.14 | 0.56 | 0.72 | 1.12 | 1.63 | 0.92 |
| **Contact angle 25 degrees (suffix ACD, DB)** | | | | | |
| – | 0.68 | 0.67 | 0.92 | 1.41 | 0.76 |

[1] Values of $f_0$ are given in the bearing tables

# Service for a lasting partnership



Under the proper conditions, bearings can run for an almost unlimited time. For them to run at least as long as they should, operating conditions must be optimised. At SKF we know our bearings and you know your operating conditions. Together, as partners SKF can work with you during the design stage and continue to work with you right through to installation and maintenance to keep your machines in peak operating condition.

**SKF concepts for creating customer value**

Why not take advantage of SKF competencies for creating customer value? Decades of troubleshooting experience in virtually every industrial sector enables SKF to provide solutions that improve machine performance and productivity. With our Total Shaft Solutions™ concept you can take full advantage of our in-depth competence comprising

- Root cause failure analysis and elimination
- Rotating equipment engineering
- Products, services and systems
- Machine monitoring

Another SKF concept that embraces a broader view of customer-focused technologies and competencies is called Asset Efficiency Optimization™, or AEO for short. As the name implies, AEO recognizes the importance of treating machinery and equipment as plant assets. SKF programs that take a systems approach to optimizing these customer assets include

- Predictive Maintenance,
- Pro-active Reliability Maintenance
- Operator-driven Reliability, and
- Integrated Maintenance Solutions, an all-inclusive contractual program.

For more information about SKF competencies and services, contact your local SKF representative.

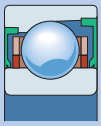
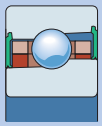
# Applications

Sealed high-precision angular contact ball bearings are used primarily in the machine tool industry, both in metal cutting and in woodworking spindles.

Other applications may call for high-precision bearings when high accuracy and very high speed are required.

***Selecting sealed high-precision angular contact ball bearings based on application requirements***

**Table 3**

| Application | CD/ACD design | CB/FB/DB design | Working conditions |
|---|---|---|---|
| |  |  | |
|  High speed woodworking spindles | ooo | ooooo | Very high speed, light to moderate working loads. Constant load preloading. |
|  High speed metal cutting spindles (machining centres, high speed milling) | ooo | ooooo | Very high speed, light to moderate working loads. Constant load preloading. |
|  CNC lathes and conventional milling machines | ooooo | oo | High speed, moderate to heavy loads, high rigidity, constant position preloading. |

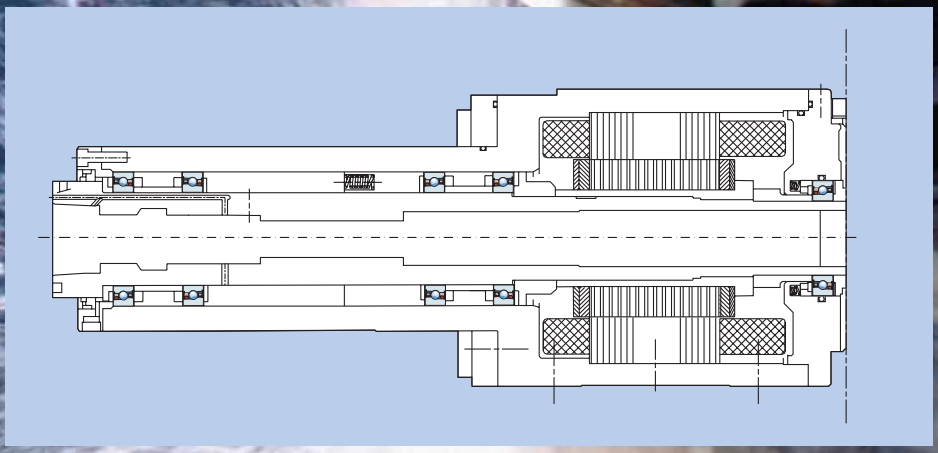
ooooo excellent  oooo very good  ooo good  oo acceptable  o not recommended

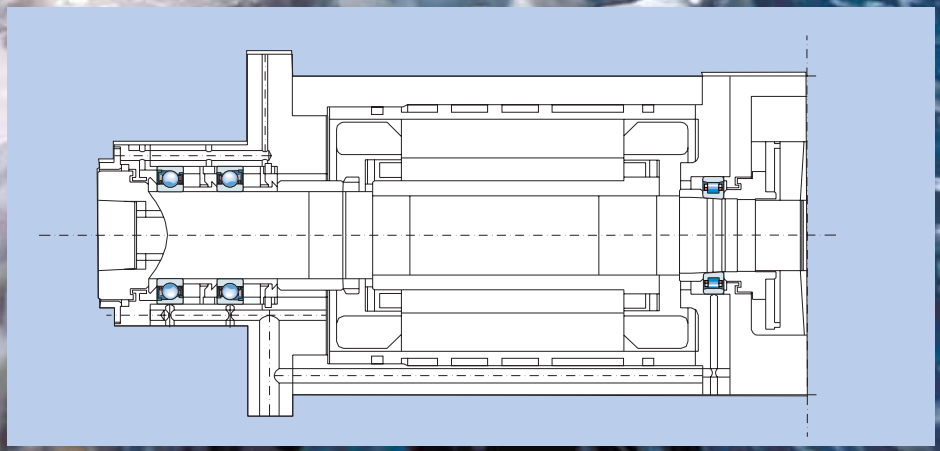
**1** Product information
Page ..... 3

**2** Recommendations

**3** Product data
Page ..... 16







# General bearing data

## Dimensions

SKF sealed high-precision angular contact ball bearings boundary dimensions conform to ISO 15:1998, Diameter Series 9 and 0.

## Tolerances

SKF sealed high-precision angular contact ball bearings series CD/ACD are manufactured to the P4A tolerance class as standard. Upon request, bearings can be made according to class PA9A or other specifications. Sealed bearings series CB, FB and DB are made to the P7 tolerance class as standard. Upon request they can be manufactured to tolerance class P9.

The values for P4A, P7, PA9A and P9 tolerances are given in **table** 1 and **table** 2 **page 18**. Hybrid bearings are made to the same tolerances as the corresponding all-steel bearings.

### Tolerance symbols

Following are explanations for the symbols used in the tolerance tables:

| Symbol | Definition |
|---|---|
| $d$ | Nominal bore diameter |
| $d_{mp}$ | Mean bore diameter; arithmetical mean of the largest and smallest single bore diameters in one plane |
| $d_s$ | Single diameter of bore |
| $\Delta_{dmp}$ | Deviation of the mean bore diameter from the nominal |
| $\Delta_{ds}$ | Deviation of a single bore diameter from the nominal |
| $V_{dp}$ | Bore diameter variation; difference between the largest and smallest single bore diameters in one plane |
| $V_{dmp}$ | Mean bore diameter variation; difference between the largest and smallest mean bore diameters of one ring |
| $D$ | Nominal outside diameter |
| $D_{mp}$ | Mean outside diameter; arithmetical mean of the largest and smallest single outside diameters in one plane |
| $D_s$ | Single diameter of outside cylindrical surface |
| $\Delta_{Dmp}$ | Deviation of the mean outside diameter from the nominal |
| $\Delta_{Ds}$ | Deviation of single outside diameter from the nominal |
| $V_{Dp}$ | Outside diameter variation; difference between the largest and smallest single outside diameters in one plane |
| $V_{Dmp}$ | Mean outside diameter variation; difference between the largest and smallest mean outside diameters of one ring |
| $B_s$, $C_s$ | Single width of inner ring and outer ring, respectively |
| $B_{1s}$, $C_{1s}$ | Single width of inner ring and outer ring, respectively, of bearings made for paired mounting |
| $\Delta_{Bs}$, $\Delta_{Cs}$ | Deviation of single inner ring width or single outer ring width from the nominal |
| $\Delta_{B1s}$, $\Delta_{C1s}$ | Deviation of single inner ring width or single outer ring width from the nominal of a bearing specially manufactured for paired mounting |
| $V_{Bs}$, $V_{Cs}$ | Ring width variation; difference between the largest and smallest single width of inner ring and outer ring, respectively |
| $K_{ia}$, $K_{ea}$ | Radial runout of assembled bearing inner ring and assembled bearing outer ring, respectively |
| $S_d$ | Side face runout with reference to bore (of inner ring) |
| $S_D$ | Outside inclination variation; variation in inclination of outside cylindrical surface to outer ring side face |
| $S_{ia}$, $S_{ea}$ | Side face runout with reference to raceway of assembled bearing inner ring and assembled bearing outer ring, respectively |

Page ..... 3
Page ..... 10



***Class P4A and P7 tolerances***

**Table 1**

**Inner ring**

| d | | $\Delta_{dmp}$ | | $\Delta_{ds}$ | | $V_{dp}$ | $V_{dmp}$ | $\Delta_{Bs}$ | | $\Delta_{B1s}$ | | $V_{Bs}$ | $K_{ia}$ | $S_d$ | $S_{ia}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| over | incl. | high | low | high | low | max | max | high | low | high | low | max | max | max | max |
| mm | | µm | | µm | | µm | µm | µm | | µm | | µm | µm | µm | µm |
| **2.5** | **10** | 0 | –4 | 0 | –4 | 1.3 | 1 | 0 | –40 | 0 | –250 | 1.3 | 1.3 | 1.3 | 1.3 |
| **10** | **18** | 0 | –4 | 0 | –4 | 1.3 | 1 | 0 | –80 | 0 | –250 | 1.3 | 1.3 | 1.3 | 1.3 |
| **18** | **30** | 0 | –5 | 0 | –5 | 1.3 | 1 | 0 | –120 | 0 | –250 | 1.3 | 2.5 | 1.3 | 2.5 |
| **30** | **50** | 0 | –6 | 0 | –6 | 1.3 | 1 | 0 | –120 | 0 | –250 | 1.3 | 2.5 | 1.3 | 2.5 |
| **50** | **80** | 0 | –7 | 0 | –7 | 2 | 1.3 | 0 | –150 | 0 | –250 | 1.3 | 2.5 | 1.3 | 2.5 |
| **80** | **120** | 0 | –8 | 0 | –8 | 2.5 | 1.5 | 0 | –200 | 0 | –250 | 2.5 | 2.5 | 2.5 | 2.5 |
| **120** | **150** | 0 | –10 | 0 | –10 | 6 | 3 | 0 | –250 | 0 | –350 | 4 | 4 | 4 | 4 |

**Outer ring**

| D | | $\Delta_{Dmp}$ | | $\Delta_{Ds}$ | | $V_{Dp}$ | $V_{Dmp}$ | $\Delta_{Cs}$ | $\Delta_{C1s}$ | $V_{Cs}$ | $K_{ea}$ | $S_D$ | $S_{ea}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| over | incl. | high | low | high | low | max | max | | | max | max | max | max |
| mm | | µm | | µm | | µm | µm | | | µm | µm | µm | µm |
| **18** | **30** | 0 | –5 | 0 | –5 | 2 | 1.3 | Values are | | 1.3 | 2.5 | 1.3 | 2.5 |
| **30** | **50** | 0 | –6 | 0 | –6 | 2 | 1.3 | | | 1.3 | 2.5 | 1.3 | 2.5 |
| **50** | **80** | 0 | –7 | 0 | –7 | 2 | 1.3 | identical to | | 1.3 | 4 | 1.3 | 4 |
| **80** | **120** | **0** | –8 | 0 | –8 | 2.5 | 1.3 | those for | | 2.5 | 5 | 2.5 | 5 |
| **120** | **150** | **0** | –9 | 0 | –9 | 2.5 | 1.5 | inner ring | | 2.5 | 5 | 2.5 | 5 |
| **150** | **180** | **0** | –10 | 0 | –10 | 6 | 3 | of same | | 4 | 6 | 4 | 6 |
| **180** | **250** | **0** | –11 | 0 | –11 | 6 | 4 | bearings | | 5 | 8 | 5 | 8 |

***Class PA9A and P9 tolerances for radial bearings***

**Table 2**

**Inner ring**

| d | | $\Delta_{ds}$ | | $V_{dp}$ | $V_{dmp}$ | $\Delta_{Bs}$ | | $v_{B1s}$ | | $V_{Bs}$ | $K_{ia}$ | $S_d$ | $S_{ia}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| over | incl. | high | low | max | max | high | low | high | low | max | max | max | max |
| mm | | $\mu$m | | $\mu$m | $\mu$m | $\mu$m | | $\mu$m | | $\mu$m | $\mu$m | $\mu$m | $\mu$m |
| **2.5** | **10** | 0 | –2.5 | 1.3 | 1 | 0 | –25 | 0 | –250 | 1.3 | 1.3 | 1.3 | 1.3 |
| **10** | **18** | 0 | –2.5 | 1.3 | 1 | 0 | –80 | 0 | –250 | 1.3 | 1.3 | 1.3 | 1.3 |
| **18** | **30** | 0 | –2.5 | 1.3 | 1 | 0 | –120 | 0 | –250 | 1.3 | 2.5 | 1.3 | 2.5 |
| **30** | **50** | 0 | –2.5 | 1.3 | 1,3 | 0 | –120 | 0 | –250 | 1.3 | 2.5 | 1.3 | 2.5 |
| **50** | **80** | 0 | –4 | 2 | 1.3 | 0 | –150 | 0 | –250 | 1.3 | 2.5 | 1.3 | 2.5 |
| **80** | **120** | 0 | –5 | 2.5 | 1.5 | 0 | –200 | 0 | –250 | 2.5 | 2.5 | 2.5 | 2.5 |
| **120** | **150** | 0 | –6.5 | 3 | 2 | 0 | –250 | 0 | –350 | 2.5 | 2.5 | 2.5 | 2.5 |

**Outer ring**

| D | | $\Delta_{Ds}$ | | $V_{Dp}$ | $V_{Dmp}$ | $\Delta_{Cs}$ | $\Delta_{C1s}$ | $V_{Cs}$ | $K_{ea}$ | $S_D$ | $S_{ea}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| over | incl. | high | low | max | max | | | max | max | max | max |
| mm | | $\mu$m | | $\mu$m | $\mu$m | | | $\mu$m | $\mu$m | $\mu$m | $\mu$m |
| **18** | **30** | 0 | –4 | 2 | 1.3 | Values are identical to those for inner ring of same bearings | | 1.3 | 2.5 | 1.3 | 2.5 |
| **30** | **50** | 0 | –4 | 2 | 1.3 | | | 1.3 | 2.5 | 1.3 | 2.5 |
| **50** | **80** | 0 | –4 | 2 | 1.3 | | | 1.3 | 4 | 1.3 | 4 |
| **80** | **120** | 0 | –5 | 2.5 | 1.3 | | | 2.5 | 5 | 2.5 | 5 |
| **120** | **150** | 0 | –5 | 2.5 | 1.5 | | | 2.5 | 5 | 2.5 | 5 |
| **150** | **180** | 0 | –6.5 | 3 | 2 | | | 4 | 5 | 2.5 | 5 |
| **180** | **250** | 0 | –7.5 | 4 | 2.5 | | | 4 | 6.5 | 4 | 6.5 |

# Preload

To meet varying customer needs in terms of speed, heat generation and rigidity, SKF offers angular contact ball bearings matched back-to-back or face-to-face in groups of two or more bearings per set with three different preload classes as standard:

Class A: light preload
Class B: medium preload
Class C: heavy preload

The degree of preload depends on the contact angle, the internal design, the material and a series of factors related to the application. Sets of three or more bearings have a higher preload than sets of two bearings. The preload value for sets incorporating three or more bearings can be calculated by multiplying the preload values of pairs reported in the tables by the following factors:

1.35 for TBT and TFT sets
1.60 for QBT and QFT sets
2.00 for QBC and QFC sets

To calculate preload for sets of bearings involving more than four bearings or for sets incorporating bearings of different designs, sizes and contact angles, please contact SKF application engineering.

The **table 3** and **table 4** **page 20** show preload values for bearing pairs arranged either back-to-back or face-to-face prior to mounting.



***Series 70***
***Preload in bearings for universal pairing and bearing sets arranged back to back or face to face***

**Table 3**

| Bearing | | Axial preload | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Series S70 ACD, and S70 ACD/HC | | | Series S70 CD and S70 CD/HC | | | Series S70 DB and SC70 DB | | | Series S70 CB,FB and SC70 CB,FB | | |
| | | Class | | | Class | | | Class | | | Class | | |
| Bore diameter | Size | A | B | C[1)] | A | B | C[1)] | A | B | C[1)] | A | B | C[1)] |
| mm | | N | | | | | | | | | | | |
| **30** | **06** | 90 | 180 | 360 | 50 | 100 | 200 | 38 | 76 | 155 | 24 | 48 | 96 |
| **35** | **07** | 90 | 180 | 360 | 60 | 120 | 240 | 40 | 80 | 160 | 26 | 52 | 105 |
| **40** | **08** | 100 | 200 | 400 | 60 | 120 | 240 | 43 | 85 | 170 | 28 | 56 | 110 |
| **45** | **09** | 170 | 340 | 680 | 110 | 220 | 440 | 57 | 115 | 230 | 35 | 70 | 140 |
| **50** | **10** | 180 | 360 | 720 | 110 | 220 | 440 | 60 | 120 | 240 | 37 | 74 | 145 |
| **55** | **11** | 230 | 460 | 920 | 150 | 300 | 600 | 83 | 165 | 330 | 52 | 105 | 210 |
| **60** | **12** | 240 | 480 | 960 | 150 | 300 | 600 | 85 | 170 | 340 | 54 | 110 | 220 |
| **65** | **13** | 240 | 480 | 960 | 160 | 320 | 640 | 92 | 185 | 370 | 57 | 115 | 230 |
| **70** | **14** | 300 | 600 | 1200 | 200 | 400 | 800 | 115 | 230 | 460 | 70 | 140 | 280 |
| **75** | **15** | 310 | 620 | 1240 | 200 | 400 | 800 | 120 | 240 | 480 | 75 | 150 | 300 |
| **80** | **16** | 390 | 780 | 1560 | 240 | 480 | 960 | 160 | 315 | 630 | 98 | 195 | 390 |
| **85** | **17** | 400 | 800 | 1600 | 250 | 500 | 1000 | 160 | 315 | 630 | 100 | 200 | 400 |
| **90** | **18** | 460 | 920 | 1840 | 300 | 600 | 1200 | 170 | 340 | 680 | 105 | 215 | 430 |
| **95** | **19** | 480 | 960 | 1920 | 310 | 620 | 1240 | 175 | 345 | 690 | 110 | 220 | 440 |
| **100** | **20** | 500 | 1000 | 2000 | 310 | 620 | 1240 | 175 | 350 | 700 | 110 | 220 | 440 |
| **110** | **22** | 650 | 1300 | 2600 | 420 | 840 | 1680 | 220 | 440 | 880 | 135 | 270 | 540 |
| **120** | **24** | 690 | 1380 | 2760 | 430 | 860 | 1720 | 230 | 460 | 920 | 140 | 280 | 560 |
| **130** | **26** | 900 | 1800 | 3600 | 560 | 1120 | 2240 | — | — | — | — | — | — |
| **140** | **28** | 900 | 1800 | 3600 | 570 | 1140 | 2280 | — | — | — | — | — | — |
| **150** | **30** | 1000 | 2000 | 4000 | 650 | 1300 | 2600 | — | — | — | — | — | — |

1) All-steel bearings only

Page ..... 3
Page ..... 10

***Series 719***
***Preload in bearings for universal pairing and bearing sets arranged back to back or face to face***

**Table 4**

| Bearing | | Series S719 ACD, and S719 ACD/HC | | | Series S719 CD and S719 CD/HC | | | Series S719 DB and SC719 DB | | | Series S719 CB,FB and SC719 CB,FB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Class** | | | **Class** | | | **Class** | | | **Class** | | |
| Bore diameter | Size | A | B | C[1)] | A | B | C[1)] | A | B | C[1)] | A | B | C[1)] |
| mm | | N | | | | | | | | | | | |
| 30 | 06 | 40 | 80 | 160 | 25 | 50 | 100 | 29 | 58 | 115 | 18 | 36 | 72 |
| 35 | 07 | 60 | 120 | 240 | 35 | 70 | 140 | 30 | 60 | 120 | 19 | 38 | 76 |
| 40 | 08 | 70 | 140 | 280 | 45 | 90 | 180 | 32 | 64 | 125 | 20 | 40 | 80 |
| 45 | 09 | 80 | 160 | 320 | 50 | 100 | 200 | 44 | 88 | 175 | 28 | 56 | 110 |
| 50 | 10 | 80 | 160 | 320 | 50 | 100 | 200 | 46 | 92 | 185 | 29 | 58 | 115 |
| 55 | 11 | 120 | 240 | 480 | 70 | 140 | 280 | 58 | 115 | 230 | 37 | 75 | 150 |
| 60 | 12 | 120 | 240 | 480 | 70 | 140 | 280 | 60 | 120 | 240 | 38 | 76 | 150 |
| 65 | 13 | 120 | 240 | 480 | 80 | 160 | 320 | 63 | 125 | 250 | 40 | 80 | 160 |
| 70 | 14 | 200 | 400 | 800 | 130 | 260 | 520 | 80 | 160 | 320 | 50 | 100 | 200 |
| 75 | 15 | 210 | 420 | 840 | 130 | 260 | 520 | 83 | 165 | 330 | 52 | 105 | 210 |
| 80 | 16 | 220 | 440 | 880 | 140 | 280 | 560 | 93 | 185 | 370 | 60 | 120 | 240 |
| 85 | 17 | 270 | 540 | 1080 | 170 | 340 | 680 | 100 | 200 | 400 | 63 | 125 | 250 |
| 90 | 18 | 280 | 560 | 1120 | 180 | 360 | 720 | 105 | 210 | 420 | 65 | 130 | 260 |
| 95 | 19 | 290 | 580 | 1160 | 190 | 380 | 760 | 110 | 220 | 440 | 70 | 140 | 280 |
| 100 | 20 | 360 | 720 | 1440 | 230 | 460 | 920 | 140 | 280 | 560 | 90 | 180 | 360 |
| 110 | 22 | 370 | 740 | 1480 | 230 | 460 | 920 | 150 | 300 | 600 | 95 | 190 | 380 |
| 120 | 24 | 450 | 900 | 1800 | 290 | 580 | 1160 | 170 | 340 | 680 | 105 | 210 | 420 |
| 130 | 26 | 540 | 1080 | 2160 | 350 | 700 | 1400 | — | — | — | — | — | — |
| 140 | 28 | 560 | 1120 | 2240 | 360 | 720 | 1440 | — | — | — | — | — | — |
| 150 | 30 | 740 | 1480 | 2960 | 470 | 940 | 1880 | — | — | — | — | — | — |

1) All-steel bearings only

Page ..... 3
Page ..... 10



# Materials

Bearings operate under rolling contact fatigue stress with various additional stresses or environmental conditions imposed, so for the best performance and reliability, the bearing steel and hardening heat treatment aspects are of critical importance.

The standard SKF bearing steel that is also used for sealed high-precision angular contact ball bearings has “high carbon” content according to the accepted classification parameters (more than 0.5%). Additional alloying elements like Chromium, Manganese and Molybdenum are included in the steel composition to obtain the necessary properties in the finished components.

# Cages

Sealed high-precision angular contact ball bearings are as standard equipped with outer ring land riding fabric-reinforced phenolic resin cages. The cages are lightweight and designed to minimize the centrifugal force while ensuring an optimum lubricant flow throughout the ball-raceway contact. Cages are not identified in the bearing designation.

# Speed

The speed ratings quoted in the product tables are guideline values and are valid provided that the bearings are lightly loaded ($P < 0.06\ C$), lightly preloaded by means of springs, and the conduction of heat away from the bearing is good.

The values under oil spot lubrication are maximum values and should be reduced for certain other methods of oil lubrication. The values under grease lubrication are maximum values that can be attained using a good quality grease of soft consistency.

If single angular contact ball bearings have to be adjusted against each other to a greater degree – e.g., to increase spindle stiffness, or if matched sets of two, three or four bearings are to be used and bearings are rigidly preloaded – the speed rating values given in the tables must be reduced (➔ **tables** 5)

# Greases

Sealed high-precision angular contact ball bearings are, as standard, filled in with high quality low consistency lithium complex grease with syntetic base oil.

The standard filling grade for sealed high-precision angular contact ball bearings is 25 ÷ 35%.

***Speed reduction factors for preloaded sets of sealed high-precision angular contact ball bearings.***

**Table 5**

| Bearing arrangement | Preload | | |
|---|---|---|---|
| | A | B | C |
| Set of 2 bearings paired in tandem | 0.90 | 0.80 | 0.65 |
| Set of 2 bearings paired back to back or face to face | 0.80 | 0.70 | 0.55 |
| Set of 3 bearings | 0.70 | 0.55 | 0.35 |
| Set of 4 bearings | 0.65 | 0.45 | 0.25 |

Note: values apply both to all-steel and hybrid bearings

# Designation systems

The complete designation of a single bearing identifies the series, bore diameter, contact angle and design as well as the suffix indicating the tolerance class.

The designation of bearing sets also includes suffixes indicating the number of bearings in the set, their arrangement and preload. Additional digits can be added to identify bearings incorporating special features such as greases and special tolerances. Please contact SKF for specific information.

The designation scheme of SKF sealed high-precision angular contact ball bearings is shown in **table** 6.



Table 6

**EXAMPLE**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S | 719 | 10 | AC | D | | / | HC | P4A | Q | BC | A |
| SC | 719 | 10 | F | B | | / | | P9 | Q | BC | A |

**Features**

**S** Sealed bearing
**C** Ceramic rolling elements (B internal design only)

**Bearing series**

**719** Single row angular contact ball bearing, ISO Dimension Series 19
**70** Single row angular contact ball bearing, ISO Dimension Series 10

**Bore diameter**

**06** (×5) 30 mm bore diameter
**I**
**30** (×5) 150 mm bore diameter

**Contact angle**

**C** 15°
**F** 18°
**AC or D** 25°

**Internal design**

**D** Standard design
**B** High speed design

**Cage design and material**

**—** Outer ring land riding, fabric reinforced phenolic resin

**Rolling element material**

**—** Steel
**HC** Ceramic rolling elements (D internal design only)

**Tolerance class**

**P4A, P7** Dimensional accuracy to ISO class 4, running accuracy better than ISO class 4
**PA9A, P9** Accuracy to ABMA class ABEC 9

**Number of bearings in set**

**D** 2 bearings in matched set
**T** 3 bearings in matched set
**Q** 4 bearings in matched set

**Bearing arrangement in matched set**

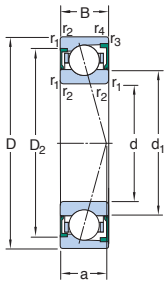
**B** Back-to-back
**F** Face-to-face
**T** Tandem
**BT** Back-to-back/tandem
**FT** Face-to-face/tandem
**BC** Back-to-back of pairs in tandem
**FC** Face-to-face of pairs in tandem
**G** For universal pairing

**Preload**

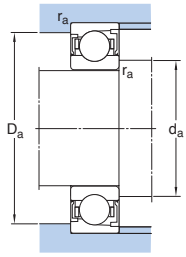
**A** Light preload
**B** Medium preload
**C** Heavy preload
**G..** Special preload, value in daN, e.g. G240

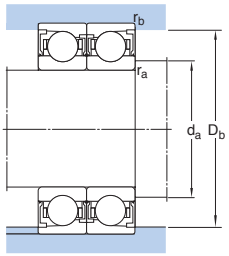
**Sealed high-precision angular contact ball bearings**

d **30-80** mm




| Principal dimensions | | | Load dynam. | Rating stat. | | | Reference speed Lubrication | | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|---|
| d | D | B | C | $C_o$ | $P_u$ | $f_o$ | grease | oil-air | | |
| mm | mm | mm | N | N | N | | r/min | r/min | kg | - |
| **30** | 47 | 9 | 7150 | 4550 | 193 | 10 | 30000 | 45000 | 0.051 | **S71906 CD** |
| | 47 | 9 | 6760 | 4300 | 183 | - | 26000 | 40000 | 0.051 | **S71906 ACD** |
| | 55 | 13 | 14300 | 8000 | 345 | 9.4 | 28000 | 43000 | 0.11 | **S7006 CD** |
| | 55 | 13 | 13800 | 7650 | 325 | - | 24000 | 38000 | 0.11 | **S7006 ACD** |
| **35** | 55 | 10 | 9750 | 6550 | 275 | 10 | 26000 | 40000 | 0.078 | **S71907 CD** |
| | 55 | 10 | 9230 | 6200 | 260 | - | 22000 | 36000 | 0.078 | **S71907 ACD** |
| | 62 | 14 | 15600 | 9500 | 400 | 9.7 | 22000 | 36000 | 0.15 | **S7007 CD** |
| | 62 | 14 | 14800 | 9000 | 380 | - | 19000 | 32000 | 0.15 | **S7007 ACD** |
| **40** | 62 | 12 | 12400 | 8500 | 360 | 10 | 20000 | 34000 | 0.12 | **S71908 CD** |
| | 62 | 12 | 11700 | 8000 | 340 | - | 18000 | 30000 | 0.12 | **S71908 ACD** |
| | 68 | 15 | 16800 | 11000 | 465 | 10 | 19000 | 32000 | 0.19 | **S7008 CD** |
| | 68 | 15 | 15900 | 10400 | 440 | - | 18000 | 30000 | 0.19 | **S7008 ACD** |
| **45** | 68 | 12 | 13000 | 9500 | 400 | 11 | 19000 | 32000 | 0.14 | **S71909 CD** |
| | 68 | 12 | 12400 | 9000 | 380 | - | 17000 | 28000 | 0.14 | **S71909 ACD** |
| | 75 | 16 | 28600 | 22400 | 950 | 15 | 18000 | 30000 | 0.24 | **S7009 CD** |
| | 75 | 16 | 27600 | 21600 | 900 | - | 16000 | 26000 | 0.24 | **S7009 ACD** |
| **50** | 72 | 12 | 13500 | 10400 | 440 | 11 | 17000 | 28000 | 0.14 | **S71910 CD** |
| | 72 | 12 | 12700 | 9800 | 415 | - | 16000 | 26000 | 0.14 | **S71910 ACD** |
| | 80 | 16 | 29600 | 24000 | 1020 | 15 | 17000 | 28000 | 0.26 | **S7010 CD** |
| | 80 | 16 | 28100 | 23200 | 980 | - | 15000 | 24000 | 0.26 | **S7010 ACD** |
| **55** | 80 | 13 | 19500 | 14600 | 620 | 10 | 16000 | 26000 | 0.18 | **S71911 CD** |
| | 80 | 13 | 18200 | 13700 | 585 | - | 15000 | 24000 | 0.18 | **S71911 ACD** |
| | 90 | 18 | 39700 | 32500 | 1370 | 15 | 15000 | 24000 | 0.38 | **S7011 CD** |
| | 90 | 18 | 37100 | 31000 | 1320 | - | 14000 | 22000 | 0.38 | **S7011 ACD** |
| **60** | 85 | 13 | 19900 | 15300 | 655 | 11 | 15000 | 24000 | 0.19 | **S71912 CD** |
| | 85 | 13 | 18600 | 14600 | 620 | - | 14000 | 22000 | 0.19 | **S71912 ACD** |
| | 95 | 18 | 40300 | 34500 | 1500 | 15 | 14000 | 22000 | 0.41 | **S7012 CD** |
| | 95 | 18 | 39000 | 33500 | 1400 | - | 13000 | 20000 | 0.41 | **S7012 ACD** |
| **65** | 90 | 13 | 20800 | 17000 | 710 | 11 | 14000 | 22000 | 0.21 | **S71913 CD** |
| | 90 | 13 | 19500 | 16000 | 680 | - | 13000 | 20000 | 0.21 | **S71913 ACD** |
| | 100 | 18 | 41600 | 37500 | 1600 | 16 | 14000 | 22000 | 0.43 | **S7013 CD** |
| | 100 | 18 | 39000 | 35500 | 1500 | - | 12000 | 19000 | 0.43 | **S7013 ACD** |
| **70** | 100 | 16 | 34500 | 34000 | 1430 | 16 | 13000 | 20000 | 0.34 | **S71914 CD** |
| | 100 | 16 | 32500 | 32500 | 1370 | - | 11000 | 18000 | 0.34 | **S71914 ACD** |
| | 110 | 20 | 52000 | 45500 | 1930 | 15 | 12000 | 19000 | 0.60 | **S7014 CD** |
| | 110 | 20 | 48800 | 44000 | 1860 | - | 10000 | 17000 | 0.60 | **S7014 ACD** |
| **75** | 105 | 16 | 35800 | 37500 | 1560 | 16 | 12000 | 19000 | 0.36 | **S71915 CD** |
| | 105 | 16 | 33800 | 35500 | 1500 | - | 10000 | 17000 | 0.36 | **S71915 ACD** |
| | 115 | 20 | 52700 | 49000 | 2080 | 16 | 11000 | 18000 | 0.63 | **S7015 CD** |
| | 115 | 20 | 49400 | 46500 | 1960 | - | 9500 | 16000 | 0.63 | **S7015 ACD** |
| **80** | 110 | 16 | 36400 | 39000 | 1660 | 16 | 11000 | 18000 | 0.38 | **S71916 CD** |
| | 110 | 16 | 34500 | 36500 | 1560 | - | 9500 | 16000 | 0.38 | **S71916 ACD** |
| | 125 | 22 | 65000 | 61000 | 2550 | 16 | 10000 | 17000 | 0.86 | **S7016 CD** |
| | 125 | 22 | 62400 | 58500 | 2450 | - | 9000 | 15000 | 0.86 | **S7016 ACD** |



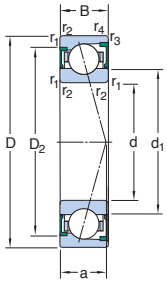



| Dimensions | | | | | | Abutment and fillet dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ | $D_2$ | $r_{1,2}$ min | $r_{3,4}$ min | a | $d_a$ min | $D_a$ max | $D_b$ max | $r_a$ max | $r_b$ max |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **30** | 35.4 | 41.6 | 0.3 | 0.15 | 10 | 32 | 45 | 45.8 | 0.3 | 0.1 |
| | 35.4 | 41.6 | 0.3 | 0.15 | 14 | 32 | 45 | 45.8 | 0.3 | 0.1 |
| | 38.1 | 46.9 | 1 | 0.3 | 12 | 36 | 49 | 53 | 1 | 0.3 |
| | 38.1 | 46.9 | 1 | 0.3 | 17 | 36 | 49 | 53 | 1 | 0.3 |
| **35** | 41.2 | 48.8 | 0.6 | 0.15 | 11 | 40 | 50 | 53.8 | 0.6 | 0.1 |
| | 41.2 | 48.8 | 0.6 | 0.15 | 16 | 40 | 50 | 53.8 | 0.6 | 0.1 |
| | 43.7 | 53.3 | 1 | 0.3 | 14 | 41 | 56 | 60 | 1 | 0.3 |
| | 43.7 | 53.3 | 1 | 0.3 | 19 | 41 | 56 | 60 | 1 | 0.3 |
| **40** | 46.7 | 55.3 | 0.6 | 0.15 | 13 | 45 | 57 | 60.8 | 0.6 | 0.1 |
| | 46.7 | 55.3 | 0.6 | 0.15 | 18 | 45 | 57 | 60.8 | 0.6 | 0.1 |
| | 49.2 | 58.8 | 1 | 0.3 | 15 | 46 | 62 | 66 | 1 | 0.3 |
| | 49.2 | 58.8 | 1 | 0.3 | 20 | 46 | 62 | 66 | 1 | 0.3 |
| **45** | 52.2 | 60.8 | 0.6 | 0.15 | 14 | 50 | 63 | 66.8 | 0.6 | 0.1 |
| | 52.2 | 60.8 | 0.6 | 0.15 | 19 | 50 | 63 | 66.8 | 0.6 | 0.1 |
| | 54.7 | 65.3 | 1 | 0.3 | 16 | 51 | 69 | 73 | 1 | 0.3 |
| | 54.7 | 65.3 | 1 | 0.3 | 22 | 51 | 69 | 73 | 1 | 0.3 |
| **50** | 56.7 | 65.3 | 0.6 | 0.15 | 14 | 55 | 67 | 70.8 | 0.6 | 0.1 |
| | 56.7 | 65.3 | 0.6 | 0.15 | 20 | 55 | 67 | 70.8 | 0.6 | 0.1 |
| | 59.7 | 70.3 | 1 | 0.3 | 17 | 56 | 74 | 78 | 1 | 0.3 |
| | 59.7 | 70.3 | 1 | 0.3 | 17 | 56 | 74 | 78 | 1 | 0.3 |
| **55** | 62.7 | 72.3 | 1 | 0.3 | 16 | 61 | 74 | 78 | 1 | 0.3 |
| | 62.7 | 72.3 | 1 | 0.3 | 22 | 61 | 74 | 78 | 1 | 0.3 |
| | 66.3 | 78.7 | 1.1 | 0.6 | 19 | 62 | 83 | 86 | 1 | 0.6 |
| | 66.3 | 78.7 | 1.1 | 0.6 | 26 | 62 | 83 | 86 | 1 | 0.6 |
| **60** | 67.7 | 77.3 | 1 | 0.3 | 16 | 66 | 79 | 83 | 1 | 0.3 |
| | 67.7 | 77.3 | 1 | 0.3 | 23 | 66 | 79 | 83 | 1 | 0.3 |
| | 71.3 | 83.7 | 1.1 | 0.6 | 20 | 67 | 88 | 91 | 1 | 0.6 |
| | 71.3 | 83.7 | 1.1 | 0.6 | 27 | 67 | 88 | 91 | 1 | 0.6 |
| **65** | 72.7 | 82.3 | 1 | 0.3 | 17 | 71 | 84 | 88 | 1 | 0.3 |
| | 72.7 | 82.3 | 1 | 0.3 | 25 | 71 | 84 | 88 | 1 | 0.3 |
| | 76.3 | 88.7 | 1.1 | 0.6 | 20 | 72 | 93 | 96 | 1 | 0.6 |
| | 76.3 | 88.7 | 1.1 | 0.6 | 28 | 72 | 93 | 96 | 1 | 0.6 |
| **70** | 79.3 | 90.7 | 1 | 0.3 | 19 | 76 | 94 | 98 | 1 | 0.3 |
| | 79.3 | 90.7 | 1 | 0.3 | 28 | 76 | 94 | 98 | 1 | 0.3 |
| | 82.9 | 97.1 | 1.1 | 0.6 | 22 | 77 | 103 | 106 | 1 | 0.6 |
| | 82.9 | 97.1 | 1.1 | 0.6 | 31 | 77 | 103 | 106 | 1 | 0.6 |
| **75** | 84.3 | 95.7 | 1 | 0.3 | 20 | 81 | 99 | 103 | 1 | 0.3 |
| | 84.3 | 95.7 | 1 | 0.3 | 29 | 81 | 99 | 103 | 1 | 0.3 |
| | 87.9 | 103 | 1.1 | 0.6 | 23 | 82 | 108 | 111 | 1 | 0.6 |
| | 87.9 | 103 | 1.1 | 0.6 | 32 | 82 | 108 | 111 | 1 | 0.6 |
| **80** | 89.3 | 101 | 1 | 0.3 | 21 | 86 | 104 | 108 | 1 | 0.3 |
| | 89.3 | 101 | 1 | 0.3 | 30 | 86 | 104 | 108 | 1 | 0.3 |
| | 94.4 | 111 | 1.1 | 0.6 | 25 | 87 | 118 | 121 | 1 | 0.6 |
| | 94.4 | 111 | 1.1 | 0.6 | 35 | 87 | 118 | 121 | 1 | 0.6 |

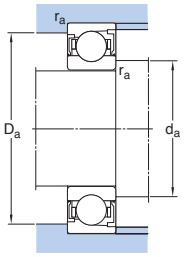
Page ..... 3 Page ..... 10

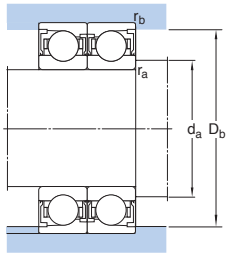
**Sealed high-precision angular contact ball bearings**

d **65-150** mm




| Principal dimensions | | | Load dynam. | Rating stat. | | | Reference speed Lubrication | | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|---|
| d | D | B | C | $C_o$ | $P_u$ | $f_o$ | grease | oil-air | | |
| mm | mm | mm | N | N | N | | r/min | r/min | kg | - |
| **85** | 120 | 18 | 46200 | 48000 | 2040 | 16 | 10000 | 17000 | 0.54 | **S71917 CD** |
| | 120 | 18 | 43600 | 45500 | 1930 | - | 9000 | 15000 | 0.54 | **S71917 ACD** |
| | 130 | 22 | 67600 | 65500 | 2650 | 16 | 9500 | 16000 | 0.9 | **S7017 CD** |
| | 130 | 22 | 63700 | 62000 | 2500 | - | 8500 | 14000 | 0.9 | **S7017 ACD** |
| **90** | 125 | 18 | 47500 | 51000 | 2080 | 16 | 9500 | 16000 | 0.56 | **S71918 CD** |
| | 125 | 18 | 44200 | 48000 | 1960 | - | 8500 | 14000 | 0.56 | **S71918 ACD** |
| | 140 | 24 | 79300 | 76500 | 3000 | 16 | 9000 | 15000 | 1.17 | **S7018 CD** |
| | 140 | 24 | 74100 | 72000 | 2850 | - | 8000 | 13000 | 1.17 | **S7018 ACD** |
| **95** | 130 | 18 | 49400 | 55000 | 2200 | 16 | 9000 | 15000 | 0.59 | **S71919 CD** |
| | 130 | 18 | 46200 | 52000 | 2080 | - | 8500 | 14000 | 0.59 | **S71919 ACD** |
| | 145 | 24 | 81900 | 80000 | 3100 | 16 | 8500 | 14000 | 1.22 | **S7019 CD** |
| | 145 | 24 | 76100 | 76500 | 2900 | - | 8000 | 13000 | 1.22 | **S7019 ACD** |
| **100** | 140 | 20 | 60500 | 65500 | 2550 | 16 | 8500 | 14000 | 0.81 | **S71920 CD** |
| | 140 | 20 | 57200 | 63000 | 2400 | - | 8000 | 13000 | 0.81 | **S71920 ACD** |
| | 150 | 24 | 83200 | 85000 | 3200 | 16 | 8500 | 14000 | 1.26 | **S7020 CD** |
| | 150 | 24 | 79300 | 80000 | 3050 | - | 7500 | 12000 | 1.26 | **S7020 ACD** |
| **110** | 150 | 20 | 62400 | 72000 | 2700 | 17 | 8000 | 13000 | 0.87 | **S71922 CD** |
| | 150 | 20 | 58500 | 68000 | 2550 | - | 7500 | 12000 | 0.87 | **S71922 ACD** |
| | 170 | 28 | 111000 | 108000 | 3900 | 16 | 7500 | 12000 | 1.98 | **S7022 CD** |
| | 170 | 28 | 104000 | 104000 | 3750 | - | 7000 | 11000 | 1.98 | **S7022 ACD** |
| **120** | 165 | 22 | 78000 | 91500 | 3250 | 16 | 7500 | 12000 | 1.2 | **S71924 CD** |
| | 165 | 22 | 72800 | 86500 | 3050 | - | 7000 | 11000 | 1.2 | **S71924 ACD** |
| | 180 | 28 | 114000 | 122000 | 4250 | 16 | 7000 | 11000 | 2.14 | **S7024 CD** |
| | 180 | 28 | 111000 | 116000 | 4000 | - | 6700 | 10000 | 2.14 | **S7024 ACD** |
| **130** | 180 | 24 | 92300 | 108000 | 3650 | 16 | 7000 | 11000 | 1.58 | **S71926 CD** |
| | 180 | 24 | 87100 | 102000 | 3450 | - | 6700 | 10000 | 1.58 | **S71926 ACD** |
| | 200 | 33 | 148000 | 156000 | 5200 | 16 | 6700 | 10000 | 3.26 | **S7026 CD** |
| | 200 | 33 | 140000 | 150000 | 4900 | - | 6000 | 9000 | 3.26 | **S7026 ACD** |
| **140** | 190 | 24 | 95600 | 116000 | 3900 | 17 | 6700 | 10000 | 1.68 | **S71928 CD** |
| | 190 | 24 | 90400 | 110000 | 3650 | - | 6000 | 9000 | 1.68 | **S71928 ACD** |
| | 210 | 33 | 153000 | 166000 | 5300 | 16 | 6700 | 10000 | 3.44 | **S7028 CD** |
| | 210 | 33 | 146000 | 156000 | 5100 | - | 5600 | 8500 | 3.44 | **S7028 ACD** |
| **150** | 210 | 28 | 125000 | 146000 | 4750 | 16 | 6300 | 9500 | 2.57 | **S71930 CD** |
| | 210 | 28 | 119000 | 140000 | 4500 | - | 5000 | 8500 | 2.57 | **S71930 ACD** |
| | 225 | 35 | 172000 | 190000 | 5850 | 16 | 6000 | 9000 | 4.19 | **S7030 CD** |
| | 225 | 35 | 163000 | 180000 | 5600 | - | 5300 | 8000 | 4.19 | **S7030 ACD** |



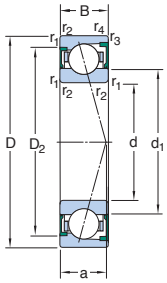





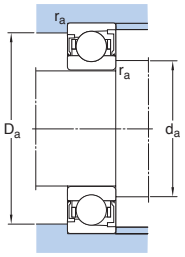

| Dimensions | | | | | | Abutment and fillet dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ | $D_2$ | $r_{1,2}$ min | $r_{3,4}$ min | a | $d_a$ min | $D_a$ max | $D_b$ max | $r_a$ max | $r_b$ max |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **85** | 95.8 | 110 | 1.1 | 0.6 | 23 | 92 | 113 | 115 | 1 | 0.6 |
| | 95.8 | 110 | 1.1 | 0.6 | 23 | 92 | 113 | 115 | 1 | 0.6 |
| | 99.4 | 116 | 1.1 | 0.6 | 36 | 92 | 123 | 126 | 1 | 0.6 |
| | 106 | 130 | 1.1 | 0.6 | 30 | 95 | 140 | 144 | 1 | 0.6 |
| **90** | 100 | 115 | 1.1 | 0.6 | 23 | 97 | 118 | 120 | 1 | 0.6 |
| | 100 | 115 | 1.1 | 0.6 | 34 | 97 | 118 | 120 | 1 | 0.6 |
| | 106 | 124 | 1.5 | 0.6 | 39 | 99 | 131 | 135 | 1.5 | 0.6 |
| | 106 | 124 | 1.5 | 0.6 | 32 | 100 | 150 | 135 | 1.5 | 0.6 |
| **95** | 105 | 120 | 1.1 | 0.6 | 24 | 102 | 123 | 125 | 1 | 0.6 |
| | 105 | 120 | 1.1 | 0.6 | 35 | 102 | 123 | 125 | 1 | 0.6 |
| | 111 | 129 | 1.5 | 0.6 | 28 | 104 | 136 | 140 | 1.5 | 0.6 |
| | 111 | 129 | 1.5 | 0.6 | 40 | 104 | 136 | 140 | 1.5 | 0.6 |
| **100** | 112 | 128 | 1.1 | 0.6 | 26 | 107 | 133 | 135 | 1 | 0.6 |
| | 112 | 128 | 1.1 | 0.6 | 38 | 107 | 133 | 135 | 1 | 0.6 |
| | 116 | 134 | 1.5 | 0.6 | 29 | 109 | 141 | 145 | 1.5 | 0.6 |
| | 116 | 134 | 1.5 | 0.6 | 41 | 109 | 141 | 145 | 1.5 | 0.6 |
| **110** | 122 | 138 | 1.1 | 0.6 | 27 | 117 | 143 | 145 | 1 | 0.6 |
| | 122 | 138 | 1.1 | 0.6 | 40 | 117 | 143 | 145 | 1 | 0.6 |
| | 129 | 151 | 2 | 1 | 33 | 120 | 160 | 164 | 2 | 1 |
| | 129 | 151 | 2 | 1 | 47 | 120 | 160 | 164 | 2 | 1 |
| **120** | 133 | 152 | 1.1 | 0.6 | 30 | 127 | 158 | 160 | 1 | 0.6 |
| | 133 | 152 | 1.1 | 0.6 | 44 | 127 | 158 | 160 | 1 | 0.6 |
| | 139 | 161 | 2 | 1 | 34 | 130 | 170 | 174 | 2 | 1 |
| | 139 | 161 | 2 | 1 | 49 | 130 | 170 | 174 | 2 | 1 |
| **130** | 145 | 165 | 1.5 | 0.6 | 33 | 139 | 171 | 175 | 1.5 | 0.6 |
| | 145 | 165 | 1.5 | 0.6 | 48 | 139 | 171 | 175 | 1.5 | 0.6 |
| | 152 | 178 | 2 | 1 | 39 | 140 | 190 | 194 | 2 | 1 |
| | 152 | 178 | 2 | 1 | 55 | 140 | 190 | 194 | 2 | 1 |
| **140** | 155 | 175 | 1.5 | 0.6 | 34 | 149 | 181 | 185 | 1.5 | 0.6 |
| | 155 | 175 | 1.5 | 0.6 | 51 | 149 | 181 | 185 | 1.5 | 0.6 |
| | 162 | 188 | 2 | 1 | 40 | 150 | 200 | 204 | 2 | 1 |
| | 162 | 188 | 2 | 1 | 58 | 150 | 200 | 204 | 2 | 1 |
| **150** | 168 | 192 | 2 | 1 | 38 | 160 | 200 | 204 | 2 | 1 |
| | 168 | 192 | 2 | 1 | 56 | 160 | 200 | 204 | 2 | 1 |
| | 174 | 201 | 2.1 | 1 | 43 | 162 | 213 | 219 | 2 | 1 |
| | 174 | 201 | 2.1 | 1 | 62 | 162 | 213 | 219 | 2 | 1 |

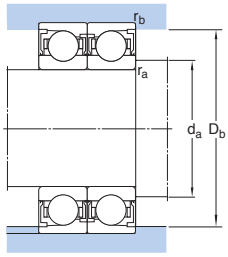
**Hybrid sealed high-precision angular contact ball bearings**

d **30-80** mm




| Principal dimensions | | | Load dynam. | Rating stat. | | | Reference speed Lubrication | | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|---|
| d | D | B | C | $C_o$ | $P_u$ | $f_o$ | grease | oil-air | | |
| mm | mm | mm | N | N | N | | r/min | r/min | kg | - |
| **30** | 47 | 9 | 7150 | 4550 | 193 | 10 | 38000 | 53000 | 0.046 | **S71906 CD/HC** |
| | 47 | 9 | 6760 | 4300 | 183 | - | 34000 | 48000 | 0.046 | **S71906 ACD/HC** |
| | 55 | 13 | 14300 | 8000 | 345 | 9.4 | 34000 | 48000 | 0.11 | **S7006 CD/HC** |
| | 55 | 13 | 13800 | 7650 | 325 | - | 32000 | 45000 | 0.11 | **S7006 ACD/HC** |
| **35** | 55 | 10 | 9750 | 6550 | 275 | 10 | 32000 | 45000 | 0.07 | **S71907 CD/HC** |
| | 55 | 10 | 9230 | 6200 | 260 | - | 30000 | 43000 | 0.07 | **S71907 ACD/HC** |
| | 62 | 14 | 15600 | 9500 | 400 | 9.7 | 30000 | 43000 | 0.15 | **S7007 CD/HC** |
| | 62 | 14 | 14800 | 9000 | 380 | - | 26000 | 38000 | 0.15 | **S7007 ACD/HC** |
| **40** | 62 | 12 | 12400 | 8500 | 360 | 10 | 28000 | 40000 | 0.11 | **S71908 CD/HC** |
| | 62 | 12 | 11700 | 8000 | 340 | - | 24000 | 36000 | 0.11 | **S71908 ACD/HC** |
| | 68 | 15 | 16800 | 11000 | 465 | 10 | 26000 | 38000 | 0.19 | **S7008 CD/HC** |
| | 68 | 15 | 15900 | 10400 | 440 | - | 22000 | 34000 | 0.19 | **S7008 ACD/HC** |
| **45** | 68 | 12 | 13000 | 9500 | 400 | 11 | 24000 | 36000 | 0.12 | **S71909 CD/HC** |
| | 68 | 12 | 12400 | 9000 | 380 | - | 22000 | 34000 | 0.12 | **S71909 ACD/HC** |
| | 75 | 16 | 28600 | 22400 | 950 | 15 | 22000 | 34000 | 0.23 | **S7009 CD/HC** |
| | 75 | 16 | 27600 | 21600 | 900 | - | 20000 | 32000 | 0.23 | **S7009 ACD/HC** |
| **50** | 72 | 12 | 13500 | 10400 | 440 | 11 | 22000 | 34000 | 0.12 | **S71910 CD/HC** |
| | 72 | 12 | 12700 | 9800 | 415 | - | 19000 | 30000 | 0.12 | **S71910 ACD/HC** |
| | 80 | 16 | 29600 | 24000 | 1020 | 15 | 20000 | 32000 | 0.25 | **S7010 CD/HC** |
| | 80 | 16 | 28100 | 23200 | 980 | - | 18000 | 28000 | 0.25 | **S7010 ACD/HC** |
| **55** | 80 | 13 | 19500 | 14600 | 620 | 10 | 19000 | 30000 | 0.15 | **S71911 CD/HC** |
| | 80 | 13 | 18200 | 13700 | 585 | - | 18000 | 28000 | 0.15 | **S71911 ACD/HC** |
| | 90 | 18 | 39700 | 32500 | 1370 | 15 | 18000 | 28000 | 0.37 | **S7011 CD/HC** |
| | 90 | 18 | 37100 | 31000 | 1320 | - | 17000 | 26000 | 0.37 | **S7011 ACD/HC** |
| **60** | 85 | 13 | 19900 | 15300 | 655 | 11 | 18000 | 28000 | 0.16 | **S71912 CD/HC** |
| | 85 | 13 | 18600 | 14600 | 620 | - | 17000 | 26000 | 0.16 | **S71912 ACD/HC** |
| | 95 | 18 | 40300 | 34500 | 1500 | 15 | 17000 | 26000 | 0.4 | **S7012 CD/HC** |
| | 95 | 18 | 39000 | 33500 | 1400 | - | 16000 | 24000 | 0.4 | **S7012 ACD/HC** |
| **65** | 90 | 13 | 20800 | 17000 | 710 | 11 | 17000 | 26000 | 0.18 | **S71913 CD/HC** |
| | 90 | 13 | 19500 | 16000 | 680 | - | 16000 | 24000 | 0.18 | **S71913 ACD/HC** |
| | 100 | 18 | 41600 | 37500 | 1600 | 16 | 16000 | 24000 | 0.42 | **S7013 CD/HC** |
| | 100 | 18 | 39000 | 35500 | 1500 | - | 15000 | 22000 | 0.42 | **S7013 ACD/HC** |
| **70** | 100 | 16 | 34500 | 34000 | 1430 | 16 | 16000 | 24000 | 0.29 | **S71914 CD/HC** |
| | 100 | 16 | 32500 | 32500 | 1370 | - | 15000 | 22000 | 0.29 | **S71914 ACD/HC** |
| | 110 | 20 | 52000 | 45500 | 1930 | 15 | 15000 | 22000 | 0.59 | **S7014 CD/HC** |
| | 110 | 20 | 48800 | 44000 | 1860 | - | 14000 | 20000 | 0.59 | **S7014 ACD/HC** |
| **75** | 105 | 16 | 35800 | 37500 | 1560 | 16 | 15000 | 22000 | 0.31 | **S71915 CD/HC** |
| | 105 | 16 | 33800 | 35500 | 1500 | - | 14000 | 20000 | 0.31 | **S71915 ACD/HC** |
| | 115 | 20 | 52700 | 49000 | 2080 | 16 | 15000 | 22000 | 0.62 | **S7015 CD/HC** |
| | 115 | 20 | 49400 | 46500 | 1960 | - | 13000 | 19000 | 0.62 | **S7015 ACD/HC** |
| **80** | 110 | 16 | 36400 | 39000 | 1660 | 16 | 15000 | 22000 | 0.32 | **S71916 CD/HC** |
| | 110 | 16 | 34500 | 36500 | 1560 | - | 13000 | 19000 | 0.32 | **S71916 ACD/HC** |
| | 125 | 22 | 65000 | 61000 | 2550 | 16 | 14000 | 20000 | 0.84 | **S7016 CD/HC** |
| | 125 | 22 | 62400 | 58500 | 2450 | - | 12000 | 18000 | 0.84 | **S7016 ACD/HC** |



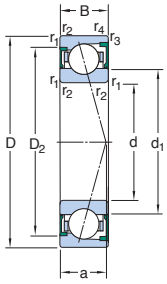





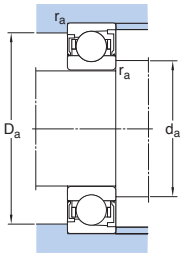

| Dimensions | | | | | | Abutment and fillet dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ | $D_2$ | $r_{1,2}$ min | $r_{3,4}$ min | a | $d_a$ min | $D_a$ max | $D_b$ max | $r_a$ max | $r_b$ max |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **30** | 35.4 | 41.6 | 0.3 | 0.15 | 10 | 32 | 45 | 45.8 | 0.3 | 0.1 |
| | 35.4 | 41.6 | 0.3 | 0.15 | 14 | 32 | 45 | 45.8 | 0.3 | 0.1 |
| | 38.1 | 46.9 | 1 | 0.3 | 12 | 36 | 49 | 53 | 1 | 0.3 |
| | 38.1 | 46.9 | 1 | 0.3 | 17 | 36 | 49 | 53 | 1 | 0.3 |
| **35** | 41.2 | 48.8 | 0.6 | 0.15 | 11 | 40 | 50 | 53.8 | 0.6 | 0.1 |
| | 41.2 | 48.8 | 0.6 | 0.15 | 16 | 40 | 50 | 53.8 | 0.6 | 0.1 |
| | 43.7 | 53.3 | 1 | 0.3 | 14 | 41 | 56 | 60 | 1 | 0.3 |
| | 43.7 | 53.3 | 1 | 0.3 | 19 | 41 | 56 | 60 | 1 | 0.3 |
| **40** | 46.7 | 55.3 | 0.6 | 0.15 | 13 | 45 | 57 | 60.8 | 0.6 | 0.1 |
| | 46.7 | 55.3 | 0.6 | 0.15 | 18 | 45 | 57 | 60.8 | 0.6 | 0.1 |
| | 49.2 | 58.8 | 1 | 0.3 | 15 | 46 | 62 | 66 | 1 | 0.3 |
| | 49.2 | 58.8 | 1 | 0.3 | 20 | 46 | 62 | 66 | 1 | 0.3 |
| **45** | 52.2 | 60.8 | 0.6 | 0.15 | 14 | 50 | 63 | 66.8 | 0.6 | 0.1 |
| | 52.2 | 60.8 | 0.6 | 0.15 | 19 | 50 | 63 | 66.8 | 0.6 | 0.1 |
| | 54.7 | 65.3 | 1 | 0.3 | 16 | 51 | 69 | 73 | 1 | 0.3 |
| | 54.7 | 65.3 | 1 | 0.3 | 22 | 51 | 69 | 73 | 1 | 0.3 |
| **50** | 56.7 | 65.3 | 0.6 | 0.15 | 14 | 55 | 67 | 70.8 | 0.6 | 0.1 |
| | 56.7 | 65.3 | 0.6 | 0.15 | 20 | 55 | 67 | 70.8 | 0.6 | 0.1 |
| | 59.7 | 70.3 | 1 | 0.3 | 17 | 56 | 74 | 78 | 1 | 0.3 |
| | 59.7 | 70.3 | 1 | 0.3 | 17 | 56 | 74 | 78 | 1 | 0.3 |
| **55** | 62.7 | 72.3 | 1 | 0.3 | 16 | 61 | 74 | 78 | 1 | 0.3 |
| | 62.7 | 72.3 | 1 | 0.3 | 22 | 61 | 74 | 78 | 1 | 0.3 |
| | 66.3 | 78.7 | 1.1 | 0.6 | 19 | 62 | 83 | 86 | 1 | 0.6 |
| | 66.3 | 78.7 | 1.1 | 0.6 | 26 | 62 | 83 | 86 | 1 | 0.6 |
| **60** | 67.7 | 77.3 | 1 | 0.3 | 16 | 66 | 79 | 83 | 1 | 0.3 |
| | 67.7 | 77.3 | 1 | 0.3 | 23 | 66 | 79 | 83 | 1 | 0.3 |
| | 71.3 | 83.7 | 1.1 | 0.6 | 20 | 67 | 88 | 91 | 1 | 0.6 |
| | 71.3 | 83.7 | 1.1 | 0.6 | 27 | 67 | 88 | 91 | 1 | 0.6 |
| **65** | 72.7 | 82.3 | 1 | 0.3 | 17 | 71 | 84 | 88 | 1 | 0.3 |
| | 72.7 | 82.3 | 1 | 0.3 | 25 | 71 | 84 | 88 | 1 | 0.3 |
| | 76.3 | 88.7 | 1.1 | 0.6 | 20 | 72 | 93 | 96 | 1 | 0.6 |
| | 76.3 | 88.7 | 1.1 | 0.6 | 28 | 72 | 93 | 96 | 1 | 0.6 |
| **70** | 79.3 | 90.7 | 1 | 0.3 | 19 | 76 | 94 | 98 | 1 | 0.3 |
| | 79.3 | 90.7 | 1 | 0.3 | 28 | 76 | 94 | 98 | 1 | 0.3 |
| | 82.9 | 97.1 | 1.1 | 0.6 | 22 | 77 | 103 | 106 | 1 | 0.6 |
| | 82.9 | 97.1 | 1.1 | 0.6 | 31 | 77 | 103 | 106 | 1 | 0.6 |
| **75** | 84.3 | 95.7 | 1 | 0.3 | 20 | 81 | 99 | 103 | 1 | 0.3 |
| | 84.3 | 95.7 | 1 | 0.3 | 29 | 81 | 99 | 103 | 1 | 0.3 |
| | 87.9 | 103 | 1.1 | 0.6 | 23 | 82 | 108 | 111 | 1 | 0.6 |
| | 87.9 | 103 | 1.1 | 0.6 | 32 | 82 | 108 | 111 | 1 | 0.6 |
| **80** | 89.3 | 101 | 1 | 0.3 | 21 | 86 | 104 | 108 | 1 | 0.3 |
| | 89.3 | 101 | 1 | 0.3 | 30 | 86 | 104 | 108 | 1 | 0.3 |
| | 94.4 | 111 | 1.1 | 0.6 | 25 | 87 | 118 | 121 | 1 | 0.6 |
| | 94.4 | 111 | 1.1 | 0.6 | 35 | 87 | 118 | 121 | 1 | 0.6 |

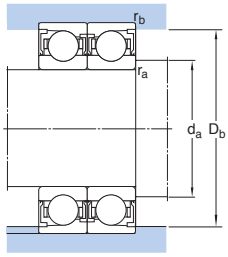
**Hybrid sealed high-precision angular contact ball bearings**

d **65-140** mm




| Principal dimensions | | | Load dynam. | Rating stat. | | | Reference speed Lubrication | | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|---|
| d | D | B | C | $C_o$ | $P_u$ | $f_o$ | grease | oil-air | | |
| mm | mm | mm | N | N | N | | r/min | r/min | kg | - |
| **85** | 120 | 18 | 46200 | 48000 | 2040 | 16 | 14000 | 20000 | 0.46 | **S71917 CD/HC** |
| | 120 | 18 | 43600 | 45500 | 1930 | - | 12000 | 18000 | 0.46 | **S71917 ACD/HC** |
| | 130 | 22 | 67600 | 65500 | 2650 | 16 | 13000 | 19000 | 0.88 | **S7017 CD/HC** |
| | 130 | 22 | 63700 | 62000 | 2500 | - | 11000 | 17000 | 0.88 | **S7017 ACD/HC** |
| **90** | 125 | 18 | 47500 | 51000 | 2080 | 16 | 13000 | 19000 | 0.48 | **S71918 CD/HC** |
| | 125 | 18 | 44200 | 48000 | 1960 | - | 11000 | 17000 | 0.48 | **S71918 ACD/HC** |
| | 140 | 24 | 79300 | 76500 | 3000 | 16 | 12000 | 18000 | 1.14 | **S7018 CD/HC** |
| | 140 | 24 | 74100 | 72000 | 2850 | - | 10000 | 16000 | 1.14 | **S7018 ACD/HC** |
| **95** | 130 | 18 | 49400 | 55000 | 2200 | 16 | 12000 | 18000 | 0.5 | **S71919 CD/HC** |
| | 130 | 18 | 46200 | 52000 | 2080 | - | 10000 | 16000 | 0.5 | **S71919 ACD/HC** |
| | 145 | 24 | 81900 | 80000 | 3100 | 16 | 11000 | 17000 | 1.19 | **S7019 CD/HC** |
| | 145 | 24 | 76100 | 76500 | 2900 | - | 9500 | 15000 | 1.19 | **S7019 ACD/HC** |
| **100** | 140 | 20 | 60500 | 65500 | 2550 | 16 | 11000 | 17000 | 0.68 | **S71920 CD/HC** |
| | 140 | 20 | 57200 | 63000 | 2400 | - | 9500 | 15000 | 0.68 | **S71920 ACD/HC** |
| | 150 | 24 | 83200 | 85000 | 3200 | 16 | 10000 | 16000 | 1.23 | **S7020 CD/HC** |
| | 150 | 24 | 79300 | 80000 | 3050 | - | 9500 | 15000 | 1.23 | **S7020 ACD/HC** |
| **110** | 150 | 20 | 62400 | 72000 | 2700 | 17 | 10000 | 16000 | 0.74 | **S71922 CD/HC** |
| | 150 | 20 | 58500 | 68000 | 2550 | - | 9000 | 14000 | 0.74 | **S71922 ACD/HC** |
| **120** | 165 | 22 | 78000 | 91500 | 3250 | 16 | 9000 | 14000 | 1.01 | **S71924 CD/HC** |
| | 165 | 22 | 72800 | 86500 | 3050 | - | 8500 | 17000 | 1.01 | **S71924 ACD/HC** |
| **130** | 180 | 24 | 92300 | 108000 | 3650 | 16 | 8500 | 13000 | 1.32 | **S71926 CD/HC** |
| | 180 | 24 | 87100 | 102000 | 3450 | - | 8000 | 12000 | 1.32 | **S71926 ACD/HC** |
| **140** | 190 | 24 | 95600 | 116000 | 3900 | 17 | 8000 | 12000 | 1.41 | **S71928 CD/HC** |
| | 190 | 24 | 90400 | 110000 | 3650 | - | 7500 | 11000 | 1.41 | **S71928 ACD/HC** |



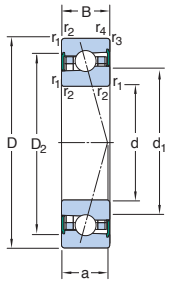





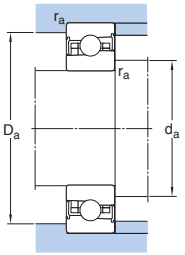

| Dimensions | | | | | | Abutment and fillet dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ | $D_2$ | $r_{1,2}$ min | $r_{3,4}$ min | a | $d_a$ min | $D_a$ max | $D_b$ max | $r_a$ max | $r_b$ max |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **85** | 95.8 | 110 | 1.1 | 0.6 | 23 | 92 | 113 | 115 | 1 | 0.6 |
| | 95.8 | 110 | 1.1 | 0.6 | 23 | 92 | 113 | 115 | 1 | 0.6 |
| | 99.4 | 116 | 1.1 | 0.6 | 36 | 92 | 123 | 126 | 1 | 0.6 |
| | 106 | 130 | 2 | 1 | 30 | 95 | 140 | 144 | 2 | 1 |
| **90** | 100 | 115 | 1.1 | 0.6 | 23 | 97 | 118 | 120 | 1 | 0.6 |
| | 100 | 115 | 1.1 | 0.6 | 34 | 97 | 118 | 120 | 1 | 0.6 |
| | 106 | 124 | 1.5 | 0.6 | 39 | 99 | 131 | 135 | 1.5 | 0.6 |
| | 106 | 124 | 2 | 1 | 32 | 100 | 150 | 135 | 1.5 | 0.6 |
| **95** | 105 | 120 | 1.1 | 0.6 | 24 | 102 | 123 | 125 | 1 | 0.6 |
| | 105 | 120 | 1.1 | 0.6 | 35 | 102 | 123 | 125 | 1 | 0.6 |
| | 111 | 129 | 1.5 | 0.6 | 28 | 104 | 136 | 140 | 1.5 | 0.6 |
| | 111 | 129 | 1.5 | 0.6 | 40 | 104 | 136 | 140 | 1.5 | 0.6 |
| **100** | 112 | 128 | 1.1 | 0.6 | 26 | 107 | 133 | 135 | 1 | 0.6 |
| | 112 | 128 | 1.1 | 0.6 | 38 | 107 | 133 | 135 | 1 | 0.6 |
| | 116 | 134 | 1.5 | 0.6 | 29 | 109 | 141 | 145 | 1.5 | 0.6 |
| | 116 | 134 | 1.5 | 0.6 | 41 | 109 | 141 | 145 | 1.5 | 0.6 |
| **110** | 122 | 138 | 1.1 | 0.6 | 27 | 117 | 143 | 145 | 1 | 0.6 |
| | 122 | 138 | 1.1 | 0.6 | 40 | 117 | 143 | 145 | 1 | 0.6 |
| **120** | 133 | 152 | 1.1 | 0.6 | 30 | 127 | 158 | 160 | 1 | 0.6 |
| | 133 | 152 | 1.1 | 0.6 | 44 | 127 | 158 | 160 | 1 | 0.6 |
| **130** | 145 | 165 | 1.5 | 0.6 | 33 | 139 | 171 | 175 | 1.5 | 0.6 |
| | 145 | 165 | 1.5 | 0.6 | 48 | 139 | 171 | 175 | 1.5 | 0.6 |
| **140** | 155 | 175 | 1.5 | 0.6 | 34 | 149 | 181 | 185 | 1.5 | 0.6 |
| | 155 | 175 | 1.5 | 0.6 | 51 | 149 | 181 | 185 | 1.5 | 0.6 |

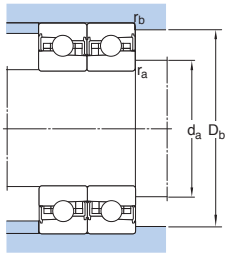
**Sealed high-precision high speed angular contact ball bearings**

d **30-80** mm




| Principal dimensions | | | Load dynam. | Rating stat. | | | Reference speed Lubrication | | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|---|
| d | D | B | C | $C_o$ | $P_u$ | $f_o$ | grease | oil-air | | |
| mm | mm | mm | N | N | N | | r/min | r/min | kg | - |
| **30** | 47 | 9 | 6370 | 5200 | 132 | 9.4 | 36000 | 56000 | 0.045 | **S71906 FB** |
| | 47 | 9 | 6050 | 4900 | 127 | - | 32000 | 50000 | 0.045 | **S71906 DB** |
| | 55 | 13 | 8840 | 7100 | 173 | 9.5 | 32000 | 50000 | 0.12 | **S7006 FB** |
| | 55 | 13 | 8320 | 6700 | 166 | - | 30000 | 46000 | 0.12 | **S7006 DB** |
| **35** | 55 | 10 | 6890 | 6200 | 153 | 9.6 | 32000 | 48000 | 0.075 | **S71907 FB** |
| | 55 | 10 | 6500 | 5850 | 146 | - | 28000 | 43000 | 0.075 | **S71907 DB** |
| | 62 | 14 | 9360 | 8300 | 204 | 9.6 | 28000 | 45000 | 0.17 | **S7007 FB** |
| | 62 | 14 | 8840 | 7800 | 193 | - | 26000 | 40000 | 0.17 | **S7007 DB** |
| **40** | 62 | 12 | 7150 | 6950 | 173 | 9.8 | 28000 | 43000 | 0.12 | **S71908 FB** |
| | 62 | 12 | 6760 | 6400 | 166 | - | 24000 | 38000 | 0.12 | **S71908 DB** |
| | 68 | 15 | 9950 | 9300 | 232 | 9.8 | 26000 | 40000 | 0.21 | **S7008 FB** |
| | 68 | 15 | 9360 | 8650 | 224 | - | 24000 | 36000 | 0.21 | **S7008 DB** |
| **45** | 68 | 12 | 9950 | 9650 | 245 | 9.8 | 24000 | 38000 | 0.13 | **S71909 FB** |
| | 68 | 12 | 9560 | 9000 | 232 | - | 22000 | 36000 | 0.13 | **S71909 DB** |
| | 75 | 16 | 13000 | 12200 | 300 | 9.6 | 24000 | 38000 | 0.26 | **S7009 FB** |
| | 75 | 16 | 12100 | 11400 | 285 | - | 20000 | 34000 | 0.26 | **S7009 DB** |
| **50** | 72 | 12 | 10400 | 10200 | 265 | 9.9 | 22000 | 36000 | 0.14 | **S71910 FB** |
| | 72 | 12 | 9750 | 9650 | 250 | - | 20000 | 34000 | 0.14 | **S71910 DB** |
| | 80 | 16 | 13300 | 13200 | 325 | 9.7 | 22000 | 34000 | 0.28 | **S7010 FB** |
| | 80 | 16 | 12500 | 12200 | 310 | - | 19000 | 30000 | 0.28 | **S7010 DB** |
| **55** | 80 | 13 | 13300 | 13700 | 340 | 9.7 | 20000 | 34000 | 0.18 | **S71911 FB** |
| | 80 | 13 | 12700 | 12700 | 325 | - | 19000 | 30000 | 0.18 | **S71911 DB** |
| | 90 | 18 | 18600 | 19000 | 465 | 9.7 | 19000 | 32000 | 0.4 | **S7011 FB** |
| | 90 | 18 | 17400 | 17600 | 440 | - | 17000 | 28000 | 0.4 | **S7011 DB** |
| **60** | 85 | 13 | 14000 | 14600 | 365 | 9.8 | 19000 | 32000 | 0.20 | **S71912 FB** |
| | 85 | 13 | 13300 | 13400 | 355 | - | 17000 | 28000 | 0.20 | **S71912 DB** |
| | 95 | 18 | 19500 | 20000 | 500 | 9.8 | 18000 | 30000 | 0.44 | **S7012 FB** |
| | 95 | 18 | 18200 | 19000 | 480 | - | 16000 | 26000 | 0.44 | **S7012 DB** |
| **65** | 90 | 13 | 14300 | 15300 | 405 | 9.9 | 18000 | 30000 | 0.2 | **S71913 FB** |
| | 90 | 13 | 13300 | 14300 | 390 | - | 16000 | 26000 | 0.2 | **S71913 DB** |
| | 100 | 18 | 19900 | 21600 | 540 | 9.7 | 17000 | 28000 | 0.45 | **S7013 FB** |
| | 100 | 18 | 19000 | 20000 | 520 | - | 15000 | 24000 | 0.45 | **S7013 DB** |
| **70** | 100 | 16 | 18200 | 20000 | 520 | 10 | 16000 | 26000 | 0.35 | **S71914 FB** |
| | 100 | 16 | 17200 | 18600 | 500 | - | 15000 | 24000 | 0.35 | **S71914 DB** |
| | 110 | 20 | 26000 | 28000 | 680 | 9.6 | 16000 | 26000 | 0.64 | **S7014 FB** |
| | 110 | 20 | 24700 | 26000 | 655 | - | 14000 | 22000 | 0.64 | **S7014 DB** |
| **75** | 105 | 16 | 19000 | 21200 | 550 | 10 | 16000 | 26000 | 0.35 | **S71915 FB** |
| | 105 | 16 | 17400 | 20000 | 530 | - | 14000 | 22000 | 0.35 | **S71915 DB** |
| | 115 | 20 | 26500 | 29000 | 735 | 9.7 | 15000 | 24000 | 0.68 | **S7015 FB** |
| | 115 | 20 | 25100 | 27000 | 710 | - | 13000 | 20000 | 0.68 | **S7015 DB** |
| **80** | 110 | 16 | 21200 | 24000 | 620 | 10 | 15000 | 24000 | 0.38 | **S71916 FB** |
| | 110 | 16 | 19500 | 22400 | 600 | - | 13000 | 20000 | 0.38 | **S71916 DB** |
| | 125 | 22 | 31200 | 34500 | 930 | 9.6 | 14000 | 22000 | 0.89 | **S7016 FB** |
| | 125 | 22 | 30200 | 32500 | 900 | - | 12000 | 19000 | 0.89 | **S7016 DB** |



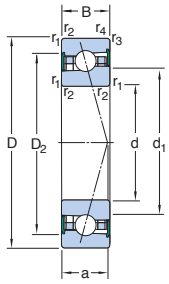





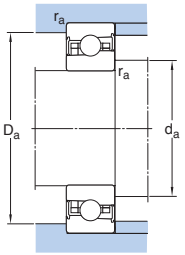

| Dimensions | | | | | | Abutment and fillet dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ | $D_2$ | $r_{1,2}$ min | $r_{3,4}$ min | a | $d_a$ min | $D_a$ max | $D_b$ max | $r_a$ max | $r_b$ max |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **30** | 36.0 | 41.2 | 0.3 | 0.3 | 11 | 32 | 45 | 45.8 | 0.3 | 0.3 |
| | 36.0 | 41.2 | 0.3 | 0.3 | 14 | 32 | 45 | 45.8 | 0.3 | 0.3 |
| | 39.5 | 45.5 | 1 | 1 | 13 | 35 | 50 | 52.8 | 1 | 1 |
| | 39.5 | 45.5 | 1 | 1 | 16 | 35 | 50 | 52.8 | 1 | 1 |
| **35** | 42.5 | 47.7 | 0.6 | 0.6 | 12 | 40 | 50 | 53.8 | 0.6 | 0.6 |
| | 42.5 | 47.7 | 0.6 | 0.6 | 16 | 40 | 50 | 53.8 | 0.6 | 0.6 |
| | 45.5 | 51.7 | 1 | 1 | 15 | 41 | 56 | 59.5 | 1 | 1 |
| | 45.5 | 51.7 | 1 | 1 | 18 | 41 | 56 | 59.5 | 1 | 1 |
| **40** | 48.5 | 53.7 | 0.6 | 0.6 | 14 | 45 | 57 | 60.8 | 0.6 | 0.6 |
| | 48.5 | 53.7 | 0.6 | 0.6 | 18 | 45 | 57 | 60.8 | 0.6 | 0.6 |
| | 51.0 | 57.2 | 1 | 1 | 16 | 46 | 62 | 65.3 | 1 | 1 |
| | 51.0 | 57.2 | 1 | 1 | 20 | 46 | 62 | 65.3 | 1 | 1 |
| **45** | 53.5 | 59.7 | 0.6 | 0.6 | 15 | 50 | 63 | 66.8 | 0.6 | 0.6 |
| | 53.5 | 59.7 | 0.6 | 0.6 | 19 | 50 | 63 | 66.8 | 0.6 | 0.6 |
| | 56.4 | 63.8 | 1 | 1 | 18 | 51 | 69 | 72 | 1 | 1 |
| | 56.4 | 63.8 | 1 | 1 | 22 | 51 | 69 | 72 | 1 | 1 |
| **50** | 58.0 | 64.2 | 0.6 | 0.6 | 16 | 55 | 67 | 70.8 | 0.6 | 0.6 |
| | 58.0 | 64.2 | 0.6 | 0.6 | 20 | 55 | 67 | 70.8 | 0.6 | 0.6 |
| | 61.4 | 68.4 | 1 | 1 | 19 | 55 | 74 | 76.8 | 1 | 1 |
| | 61.4 | 68.4 | 1 | 1 | 23 | 55 | 74 | 76.8 | 1 | 1 |
| **55** | 63.9 | 71.3 | 1 | 1 | 18 | 61 | 74 | 78 | 1 | 1 |
| | 63.9 | 71.3 | 1 | 1 | 22 | 61 | 74 | 78 | 1 | 1 |
| | 68.2 | 77.1 | 1.1 | 1.1 | 21 | 62 | 82 | 86.4 | 1 | 1 |
| | 68.2 | 77.1 | 1.1 | 1.1 | 26 | 62 | 82 | 86.4 | 1 | 1 |
| **60** | 68.9 | 76.3 | 1 | 1 | 18 | 66 | 79 | 83 | 1 | 1 |
| | 68.9 | 76.3 | 1 | 1 | 24 | 66 | 79 | 83 | 1 | 1 |
| | 73.2 | 82.1 | 1.1 | 1.1 | 22 | 67 | 88 | 91 | 1 | 1 |
| | 73.2 | 82.1 | 1.1 | 1.1 | 27 | 67 | 88 | 91 | 1 | 1 |
| **65** | 74.0 | 81.3 | 1 | 1 | 19 | 71 | 84 | 88 | 1 | 1 |
| | 74.0 | 81.3 | 1 | 1 | 25 | 71 | 84 | 88 | 1 | 1 |
| | 78.0 | 87.4 | 1.1 | 1.1 | 23 | 72 | 93 | 96 | 1 | 1 |
| | 78.0 | 87.4 | 1.1 | 1.1 | 28 | 72 | 93 | 96 | 1 | 1 |
| **70** | 80.9 | 89.3 | 1 | 1 | 22 | 76 | 94 | 98 | 1 | 1 |
| | 80.9 | 89.3 | 1 | 1 | 28 | 76 | 94 | 98 | 1 | 1 |
| | 85.0 | 95.4 | 1.1 | 1.1 | 25 | 77 | 103 | 106 | 1 | 1 |
| | 85.0 | 95.4 | 1.1 | 1.1 | 31 | 77 | 103 | 106 | 1 | 1 |
| **75** | 86.0 | 94.3 | 1 | 1 | 23 | 81 | 99 | 103 | 1 | 1 |
| | 86.0 | 94.3 | 1 | 1 | 29 | 81 | 99 | 103 | 1 | 1 |
| | 90.0 | 100.4 | 1.1 | 1.1 | 26 | 82 | 108 | 111 | 1 | 1 |
| | 90.0 | 100.4 | 1.1 | 1.1 | 32 | 82 | 108 | 111 | 1 | 1 |
| **80** | 90.7 | 99.6 | 1 | 1 | 24 | 86 | 104 | 108 | 1 | 1 |
| | 90.7 | 99.6 | 1 | 1 | 30 | 86 | 104 | 108 | 1 | 1 |
| | 96.7 | 109.0 | 1.1 | 1.1 | 28 | 87 | 118 | 121 | 1 | 1 |
| | 96.7 | 109.0 | 1.1 | 1.1 | 35 | 87 | 118 | 121 | 1 | 1 |

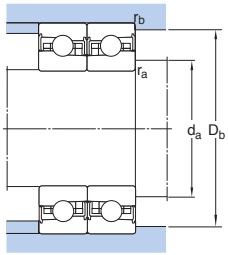
**Sealed high-precision high speed angular contact ball bearings**

d **85-120** mm




| Principal dimensions | | | Load dynam. | Rating stat. | | | Reference speed | | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lubrication | | | |
| d | D | B | C | $C_o$ | $P_u$ | $f_o$ | grease | oil-air | | |
| mm | mm | mm | N | N | N | | r/min | r/min | kg | - |
| **85** | 120 | 18 | 22100 | 26000 | 670 | 9.9 | 14000 | 22000 | 0.54 | **S71917 FB** |
| | 120 | 18 | 20300 | 24500 | 640 | - | 12000 | 19000 | 0.54 | **S71917 DB** |
| | 130 | 22 | 31900 | 36000 | 950 | 9.6 | 13000 | 20000 | 0.9 | **S7017 FB** |
| | 130 | 22 | 30200 | 33500 | 915 | - | 12000 | 18000 | 0.9 | **S7017 DB** |
| **90** | 125 | 18 | 23400 | 28500 | 710 | 10 | 13000 | 20000 | 0.57 | **S71918 FB** |
| | 125 | 18 | 22500 | 26500 | 680 | - | 12000 | 18000 | 0.57 | **S71918 DB** |
| | 140 | 24 | 37700 | 43000 | 965 | 9.7 | 12000 | 19000 | 1.21 | **S7018 FB** |
| | 140 | 24 | 35800 | 40000 | 930 | - | 11000 | 17000 | 1.21 | **S7018 DB** |
| **95** | 130 | 18 | 24700 | 30000 | 765 | 10 | 13000 | 19000 | 0.6 | **S71919 FB** |
| | 130 | 18 | 22900 | 28000 | 720 | - | 11000 | 17000 | 0.6 | **S71919 DB** |
| | 145 | 24 | 37700 | 44000 | 1000 | 9.8 | 12000 | 18000 | 1.23 | **S7019 FB** |
| | 145 | 24 | 35800 | 41500 | 950 | - | 10000 | 16000 | 1.23 | **S7019 DB** |
| **100** | 140 | 20 | 29100 | 36000 | 880 | 9.9 | 12000 | 18000 | 0.79 | **S71920 FB** |
| | 140 | 20 | 27600 | 33500 | 850 | - | 10000 | 16000 | 0.79 | **S71920 DB** |
| | 150 | 24 | 37700 | 45500 | 1020 | 9.8 | 11000 | 18000 | 1.28 | **S7020 FB** |
| | 150 | 24 | 35800 | 42500 | 980 | - | 10000 | 15000 | 1.28 | **S7020 DB** |
| **110** | 150 | 20 | 34500 | 44000 | 965 | 10 | 11000 | 17000 | 0.85 | **S71922 FB** |
| | 150 | 20 | 32500 | 40500 | 930 | - | 9500 | 15000 | 0.85 | **S71922 DB** |
| | 170 | 28 | 48800 | 60000 | 1270 | 9.8 | 10000 | 16000 | 1.98 | **S7022 FB** |
| | 170 | 28 | 46200 | 56000 | 1220 | - | 9000 | 14000 | 1.98 | **S7022 DB** |
| **120** | 165 | 22 | 36400 | 48000 | 1040 | 9.9 | 10000 | 15000 | 1.17 | **S71924 FB** |
| | 165 | 22 | 33800 | 45000 | 1000 | - | 9000 | 14000 | 1.17 | **S71924 DB** |
| | 180 | 28 | 50700 | 63000 | 1370 | 9.9 | 9000 | 14000 | 2.13 | **S7024 FB** |
| | 180 | 28 | 47500 | 58500 | 1290 | - | 8500 | 13000 | 2.13 | **S7024 DB** |



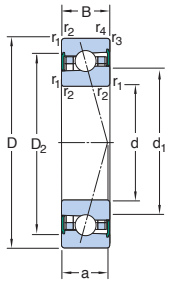





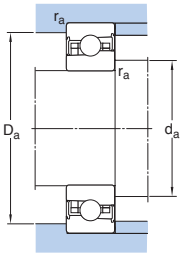

| Dimensions | | | | | | Abutment and fillet dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ | $D_2$ | $r_{1,2}$ min | $r_{3,4}$ min | a | $d_a$ min | $D_a$ max | $D_b$ max | $r_a$ max | $r_b$ max |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **85** | 98.0 | 107.4 | 1.1 | 1.1 | 26 | 92 | 113 | 115 | 1 | 1 |
| | 98.0 | 107.4 | 1.1 | 1.1 | 33 | 92 | 113 | 115 | 1 | 1 |
| | 101.7 | 114.0 | 1.1 | 1.1 | 29 | 92 | 123 | 126 | 1 | 1 |
| | 101.7 | 114.0 | 1.1 | 1.1 | 36 | 92 | 123 | 126 | 1 | 1 |
| **90** | 103.0 | 112.4 | 1.1 | 1.1 | 27 | 97 | 118 | 120 | 1 | 1 |
| | 103.0 | 112.4 | 1.1 | 1.1 | 34 | 97 | 118 | 120 | 1 | 1 |
| | 108.7 | 122.0 | 1.5 | 1.5 | 31 | 99 | 131 | 135 | 1.5 | 1.5 |
| | 108.7 | 122.0 | 1.5 | 1.5 | 39 | 99 | 131 | 135 | 1.5 | 1.5 |
| **95** | 108.0 | 117.4 | 1.1 | 1.1 | 27 | 102 | 123 | 125 | 1 | 1 |
| | 108.0 | 117.4 | 1.1 | 1.1 | 35 | 102 | 123 | 125 | 1 | 1 |
| | 113.7 | 127.0 | 1.5 | 1.5 | 32 | 104 | 136 | 140 | 1.5 | 1.5 |
| | 113.7 | 127.0 | 1.5 | 1.5 | 40 | 104 | 136 | 140 | 1.5 | 1.5 |
| **100** | 114.5 | 125.9 | 1.1 | 1.1 | 30 | 107 | 133 | 135 | 1 | 1 |
| | 114.5 | 125.9 | 1.1 | 1.1 | 38 | 107 | 133 | 135 | 1 | 1 |
| | 118.7 | 132.0 | 1.5 | 1.5 | 32 | 109 | 141 | 145 | 1.5 | 1.5 |
| | 118.7 | 132.0 | 1.5 | 1.5 | 41 | 109 | 141 | 145 | 1.5 | 1.5 |
| **110** | 124.5 | 135.9 | 1.1 | 1.1 | 31 | 117 | 143 | 145 | 1 | 1 |
| | 124.5 | 135.9 | 1.1 | 1.1 | 40 | 117 | 143 | 145 | 1 | 1 |
| | 133.2 | 147.5 | 1.5 | 1.5 | 37 | 125 | 155 | 161 | 1.5 | 1.5 |
| | 133.2 | 147.5 | 1.5 | 1.5 | 47 | 125 | 155 | 161 | 1.5 | 1.5 |
| **120** | 136.5 | 149.0 | 1.1 | 1.1 | 34 | 127 | 158 | 160 | 1 | 1 |
| | 136.5 | 149.0 | 1.1 | 1.1 | 44 | 127 | 158 | 160 | 1 | 1 |
| | 143.2 | 157.5 | 1.5 | 1.5 | 39 | 135 | 165 | 172 | 1.5 | 1.5 |
| | 143.2 | 157.5 | 1.5 | 1.5 | 49 | 135 | 165 | 172 | 1.5 | 1.5 |

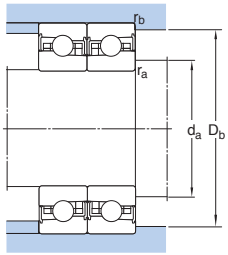
**Hybrid sealed high-precision high speed angular contact ball bearings**

d **30-80** mm




| Principal dimensions | | | Load dynam. | Rating stat. | | | Reference speed Lubrication | | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|---|
| d | D | B | C | $C_o$ | $P_u$ | $f_o$ | grease | oil-air | | |
| mm | mm | mm | N | N | N | | r/min | r/min | kg | - |
| **30** | 47 | 9 | 6370 | 5200 | 132 | 9.4 | 43000 | 67000 | 0.042 | **SC71906 FB** |
| | 47 | 9 | 6050 | 4900 | 127 | - | 38000 | 60000 | 0.042 | **SC71906 DB** |
| | 55 | 13 | 8840 | 7100 | 173 | 9.5 | 38000 | 60000 | 0.12 | **SC7006 FB** |
| | 55 | 13 | 8320 | 6700 | 166 | - | 34000 | 56000 | 0.12 | **SC7006 DB** |
| **35** | 55 | 10 | 6890 | 6200 | 153 | 9.6 | 36000 | 56000 | 0.071 | **SC71907 FB** |
| | 55 | 10 | 6500 | 5850 | 146 | - | 32000 | 53000 | 0.071 | **SC71907 DB** |
| | 62 | 14 | 9360 | 8300 | 204 | 9.6 | 34000 | 53000 | 0.16 | **SC7007 FB** |
| | 62 | 14 | 8840 | 7800 | 193 | - | 30000 | 48000 | 0.16 | **SC7007 DB** |
| **40** | 62 | 12 | 7150 | 6950 | 173 | 9.8 | 32000 | 50000 | 0.12 | **SC71908 FB** |
| | 62 | 12 | 6760 | 6400 | 166 | - | 28000 | 45000 | 0.12 | **SC71908 DB** |
| | 68 | 15 | 9950 | 9300 | 232 | 9.8 | 30000 | 48000 | 0.2 | **SC7008 FB** |
| | 68 | 15 | 9360 | 8650 | 224 | - | 26000 | 43000 | 0.2 | **SC7008 DB** |
| **45** | 68 | 12 | 9950 | 9650 | 245 | 9.8 | 28000 | 45000 | 0.12 | **SC71909 FB** |
| | 68 | 12 | 9560 | 9000 | 232 | - | 26000 | 40000 | 0.12 | **SC71909 DB** |
| | 75 | 16 | 13000 | 12200 | 300 | 9.6 | 26000 | 43000 | 0.25 | **SC7009 FB** |
| | 75 | 16 | 12100 | 11400 | 285 | - | 24000 | 38000 | 0.25 | **SC7009 DB** |
| **50** | 72 | 12 | 10400 | 10200 | 265 | 9.9 | 26000 | 43000 | 0.13 | **SC71910 FB** |
| | 72 | 12 | 9750 | 9650 | 250 | - | 24000 | 38000 | 0.13 | **SC71910 DB** |
| | 80 | 16 | 13300 | 13200 | 325 | 9.7 | 24000 | 40000 | 0.27 | **SC7010 FB** |
| | 80 | 16 | 12500 | 12200 | 310 | - | 22000 | 36000 | 0.27 | **SC7010 DB** |
| **55** | 80 | 13 | 13300 | 13700 | 340 | 9.7 | 24000 | 38000 | 0.17 | **SC71911 FB** |
| | 80 | 13 | 12700 | 12700 | 325 | - | 22000 | 34000 | 0.17 | **SC71911 DB** |
| | 90 | 18 | 18600 | 19000 | 465 | 9.7 | 22000 | 36000 | 0.38 | **SC7011 FB** |
| | 90 | 18 | 17400 | 17600 | 440 | - | 20000 | 32000 | 0.38 | **SC7011 DB** |
| **60** | 85 | 13 | 14000 | 14600 | 365 | 9.8 | 22000 | 36000 | 0.18 | **SC71912 FB** |
| | 85 | 13 | 13300 | 13400 | 355 | - | 20000 | 32000 | 0.18 | **SC71912 DB** |
| | 95 | 18 | 19500 | 20000 | 500 | 9.8 | 20000 | 34000 | 0.42 | **SC7012 FB** |
| | 95 | 18 | 18200 | 19000 | 480 | - | 18000 | 30000 | 0.42 | **SC7012 DB** |
| **65** | 90 | 13 | 14300 | 15300 | 405 | 9.9 | 20000 | 34000 | 0.19 | **SC71913 FB** |
| | 90 | 13 | 13300 | 14300 | 390 | - | 19000 | 30000 | 0.19 | **SC71913 DB** |
| | 100 | 18 | 19900 | 21600 | 540 | 9.7 | 20000 | 32000 | 0.43 | **SC7013 FB** |
| | 100 | 18 | 19000 | 20000 | 520 | - | 17000 | 28000 | 0.43 | **SC7013 DB** |
| **70** | 100 | 16 | 18200 | 20000 | 520 | 10 | 19000 | 32000 | 0.33 | **SC71914 FB** |
| | 100 | 16 | 17200 | 18600 | 500 | - | 17000 | 28000 | 0.33 | **SC71914 DB** |
| | 110 | 20 | 26000 | 28000 | 680 | 9.6 | 18000 | 30000 | 0.61 | **SC7014 FB** |
| | 110 | 20 | 24700 | 26000 | 655 | - | 16000 | 26000 | 0.61 | **SC7014 DB** |
| **75** | 105 | 16 | 19000 | 21200 | 550 | 10 | 18000 | 30000 | 0.33 | **SC71915 FB** |
| | 105 | 16 | 17400 | 20000 | 530 | - | 16000 | 26000 | 0.33 | **SC71915 DB** |
| | 115 | 20 | 26500 | 29000 | 735 | 9.7 | 17000 | 28000 | 0.65 | **SC7015 FB** |
| | 115 | 20 | 25100 | 27000 | 710 | - | 15000 | 24000 | 0.65 | **SC7015 DB** |
| **80** | 110 | 16 | 21200 | 24000 | 620 | 10 | 17000 | 28000 | 0.36 | **SC71916 FB** |
| | 110 | 16 | 19500 | 22400 | 600 | - | 15000 | 24000 | 0.36 | **SC71916 DB** |
| | 125 | 22 | 31200 | 34500 | 930 | 9.6 | 16000 | 26000 | 0.84 | **SC7016 FB** |
| | 125 | 22 | 30200 | 32500 | 900 | - | 14000 | 22000 | 0.84 | **SC7016 DB** |



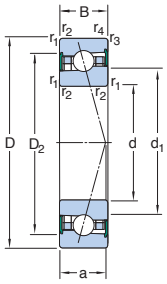





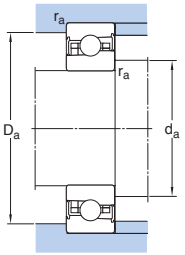

| Dimensions | | | | | | Abutment and fillet dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ | $D_2$ | $r_{1,2}$ min | $r_{3,4}$ min | a | $d_a$ min | $D_a$ max | $D_b$ max | $r_a$ max | $r_b$ max |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **30** | 36.0 | 41.2 | 0.3 | 0.3 | 11 | 32 | 45 | 45.8 | 0.3 | 0.3 |
| | 36.0 | 41.2 | 0.3 | 0.3 | 14 | 32 | 45 | 45.8 | 0.3 | 0.3 |
| | 39.5 | 45.5 | 1 | 1 | 13 | 35 | 50 | 52.8 | 1 | 1 |
| | 39.5 | 45.5 | 1 | 1 | 16 | 35 | 50 | 52.8 | 1 | 1 |
| **35** | 42.5 | 47.7 | 0.6 | 0.6 | 12 | 40 | 50 | 53.8 | 0.6 | 0.6 |
| | 42.5 | 47.7 | 0.6 | 0.6 | 16 | 40 | 50 | 53.8 | 0.6 | 0.6 |
| | 45.5 | 51.7 | 1 | 1 | 15 | 41 | 56 | 59.5 | 1 | 1 |
| | 45.5 | 51.7 | 1 | 1 | 18 | 41 | 56 | 59.5 | 1 | 1 |
| **40** | 48.5 | 53.7 | 0.6 | 0.6 | 14 | 45 | 57 | 60.8 | 0.6 | 0.6 |
| | 48.5 | 53.7 | 0.6 | 0.6 | 18 | 45 | 57 | 60.8 | 0.6 | 0.6 |
| | 51.0 | 57.2 | 1 | 1 | 16 | 46 | 62 | 65.3 | 1 | 1 |
| | 51.0 | 57.2 | 1 | 1 | 20 | 46 | 62 | 65.3 | 1 | 1 |
| **45** | 53.5 | 59.7 | 0.6 | 0.6 | 15 | 50 | 63 | 66.8 | 0.6 | 0.6 |
| | 53.5 | 59.7 | 0.6 | 0.6 | 19 | 50 | 63 | 66.8 | 0.6 | 0.6 |
| | 56.4 | 63.8 | 1 | 1 | 18 | 51 | 69 | 72 | 1 | 1 |
| | 56.4 | 63.8 | 1 | 1 | 22 | 51 | 69 | 72 | 1 | 1 |
| **50** | 58.0 | 64.2 | 0.6 | 0.6 | 16 | 55 | 67 | 70.8 | 0.6 | 0.6 |
| | 58.0 | 64.2 | 0.6 | 0.6 | 20 | 55 | 67 | 70.8 | 0.6 | 0.6 |
| | 61.4 | 68.4 | 1 | 1 | 19 | 55 | 74 | 76.8 | 1 | 1 |
| | 61.4 | 68.4 | 1 | 1 | 23 | 55 | 74 | 76.8 | 1 | 1 |
| **55** | 63.9 | 71.3 | 1 | 1 | 18 | 61 | 74 | 78 | 1 | 1 |
| | 63.9 | 71.3 | 1 | 1 | 22 | 61 | 74 | 78 | 1 | 1 |
| | 68.2 | 77.1 | 1.1 | 1.1 | 21 | 62 | 82 | 86.4 | 1 | 1 |
| | 68.2 | 77.1 | 1.1 | 1.1 | 26 | 62 | 82 | 86.4 | 1 | 1 |
| **60** | 68.9 | 76.3 | 1 | 1 | 18 | 66 | 79 | 83 | 1 | 1 |
| | 68.9 | 76.3 | 1 | 1 | 24 | 66 | 79 | 83 | 1 | 1 |
| | 73.2 | 82.1 | 1.1 | 1.1 | 22 | 67 | 88 | 91 | 1 | 1 |
| | 73.2 | 82.1 | 1.1 | 1.1 | 27 | 67 | 88 | 91 | 1 | 1 |
| **65** | 74.0 | 81.3 | 1 | 1 | 19 | 71 | 84 | 88 | 1 | 1 |
| | 74.0 | 81.3 | 1 | 1 | 25 | 71 | 84 | 88 | 1 | 1 |
| | 78.0 | 87.4 | 1.1 | 1.1 | 23 | 72 | 93 | 96 | 1 | 1 |
| | 78.0 | 87.4 | 1.1 | 1.1 | 28 | 72 | 93 | 96 | 1 | 1 |
| **70** | 80.9 | 89.3 | 1 | 1 | 22 | 76 | 94 | 98 | 1 | 1 |
| | 80.9 | 89.3 | 1 | 1 | 28 | 76 | 94 | 98 | 1 | 1 |
| | 85.0 | 95.4 | 1.1 | 1.1 | 25 | 77 | 103 | 106 | 1 | 1 |
| | 85.0 | 95.4 | 1.1 | 1.1 | 31 | 77 | 103 | 106 | 1 | 1 |
| **75** | 86.0 | 94.3 | 1 | 1 | 23 | 81 | 99 | 103 | 1 | 1 |
| | 86.0 | 94.3 | 1 | 1 | 29 | 81 | 99 | 103 | 1 | 1 |
| | 90.0 | 100.4 | 1.1 | 1.1 | 26 | 82 | 108 | 111 | 1 | 1 |
| | 90.0 | 100.4 | 1.1 | 1.1 | 32 | 82 | 108 | 111 | 1 | 1 |
| **80** | 90.7 | 99.6 | 1 | 1 | 24 | 86 | 104 | 108 | 1 | 1 |
| | 90.7 | 99.6 | 1 | 1 | 30 | 86 | 104 | 108 | 1 | 1 |
| | 96.7 | 109.0 | 1.1 | 1.1 | 28 | 87 | 118 | 121 | 1 | 1 |
| | 96.7 | 109.0 | 1.1 | 1.1 | 35 | 87 | 118 | 121 | 1 | 1 |

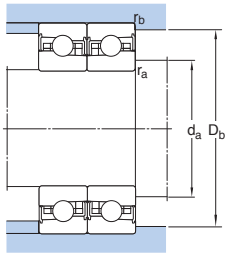
**Hybrid sealed high-precision high speed angular contact ball bearings**

d **85-120** mm




| Principal dimensions | | | Load dynam. | Rating stat. | | | Reference speed Lubrication | | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|---|
| d | D | B | C | $C_o$ | $P_u$ | $f_o$ | grease | oil-air | | |
| mm | mm | mm | N | N | N | | r/min | r/min | kg | - |
| **85** | 120 | 18 | 22100 | 26000 | 670 | 9.9 | 16000 | 26000 | 0.51 | **SC71917 FB** |
| | 120 | 18 | 20300 | 24500 | 640 | - | 14000 | 22000 | 0.51 | **SC71917 DB** |
| | 130 | 22 | 31900 | 36000 | 950 | 9.6 | 15000 | 24000 | 0.85 | **SC7017 FB** |
| | 130 | 22 | 30200 | 33500 | 915 | - | 13000 | 22000 | 0.85 | **SC7017 DB** |
| **90** | 125 | 18 | 23400 | 28500 | 710 | 10 | 15000 | 24000 | 0.54 | **SC71918 FB** |
| | 125 | 18 | 22500 | 26500 | 680 | - | 13000 | 22000 | 0.54 | **SC71918 DB** |
| | 140 | 24 | 37700 | 43000 | 965 | 9.7 | 14000 | 22000 | 1.15 | **SC7018 FB** |
| | 140 | 24 | 35800 | 40000 | 930 | - | 12000 | 20000 | 1.15 | **SC7018 DB** |
| **95** | 130 | 18 | 24700 | 30000 | 765 | 10 | 14000 | 24000 | 0.56 | **SC71919 FB** |
| | 130 | 18 | 22900 | 28000 | 720 | - | 13000 | 20000 | 0.56 | **SC71919 DB** |
| | 145 | 24 | 37700 | 44000 | 1000 | 9.8 | 13000 | 20000 | 1.16 | **SC7019 FB** |
| | 145 | 24 | 35800 | 41500 | 950 | - | 12000 | 20000 | 1.16 | **SC7019 DB** |
| **100** | 140 | 20 | 29100 | 36000 | 880 | 9.9 | 13000 | 22000 | 0.75 | **SC71920 FB** |
| | 140 | 20 | 27600 | 33500 | 850 | - | 12000 | 19000 | 0.75 | **SC71920 DB** |
| | 150 | 24 | 37700 | 45500 | 1020 | 9.8 | 13000 | 20000 | 1.21 | **SC7020 FB** |
| | 150 | 24 | 35800 | 42500 | 980 | - | 11000 | 19000 | 1.21 | **SC7020 DB** |
| **110** | 150 | 20 | 34500 | 44000 | 965 | 10 | 12000 | 20000 | 0.81 | **SC71922 FB** |
| | 150 | 20 | 32500 | 40500 | 930 | - | 11000 | 18000 | 0.81 | **SC71922 DB** |
| | 170 | 28 | 43400 | 60000 | 1270 | 9.8 | 11000 | 18000 | 1.88 | **SC7022 FB** |
| | 170 | 28 | 46200 | 56000 | 1220 | - | 10000 | 17000 | 1.88 | **SC7022 DB** |
| **120** | 165 | 22 | 36400 | 48000 | 1040 | 9.9 | 11000 | 18000 | 1.1 | **SC71924 FB** |
| | 165 | 22 | 33800 | 45000 | 1000 | - | 10000 | 16000 | 1.1 | **SC71924 DB** |
| | 180 | 28 | 50700 | 63000 | 1370 | 9.9 | 10000 | 17000 | 2.02 | **SC7024 FB** |
| | 180 | 28 | 47500 | 58500 | 1290 | - | 9500 | 16000 | 2.02 | **SC7024 DB** |






| Dimensions | | | | | | Abutment and fillet dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ | $D_2$ | $r_{1,2}$ min | $r_{3,4}$ min | a | $d_a$ min | $D_a$ max | $D_b$ max | $r_a$ max | $r_b$ max |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **85** | 98.0 | 107.4 | 1.1 | 1.1 | 26 | 92 | 113 | 115 | 1 | 1 |
| | 98.0 | 107.4 | 1.1 | 1.1 | 33 | 92 | 113 | 115 | 1 | 1 |
| | 101.7 | 114.0 | 1.1 | 1.1 | 29 | 92 | 123 | 126 | 1 | 1 |
| | 101.7 | 114.0 | 1.1 | 1.1 | 36 | 92 | 123 | 126 | 1 | 1 |
| **90** | 103.0 | 112.4 | 1.1 | 1.1 | 27 | 97 | 118 | 120 | 1 | 1 |
| | 103.0 | 112.4 | 1.1 | 1.1 | 34 | 97 | 118 | 120 | 1 | 1 |
| | 108.7 | 122.0 | 1.5 | 1.5 | 31 | 99 | 131 | 135 | 1.5 | 1.5 |
| | 108.7 | 122.0 | 1.5 | 1.5 | 39 | 99 | 131 | 135 | 1.5 | 1.5 |
| **95** | 108.0 | 117.4 | 1.1 | 1.1 | 27 | 102 | 123 | 125 | 1 | 1 |
| | 108.0 | 117.4 | 1.1 | 1.1 | 35 | 102 | 123 | 125 | 1 | 1 |
| | 113.7 | 127.0 | 1.5 | 1.5 | 32 | 104 | 136 | 140 | 1.5 | 1.5 |
| | 113.7 | 127.0 | 1.5 | 1.5 | 40 | 104 | 136 | 140 | 1.5 | 1.5 |
| **100** | 114.5 | 125.9 | 1.1 | 1.1 | 30 | 107 | 133 | 135 | 1 | 1 |
| | 114.5 | 125.9 | 1.1 | 1.1 | 38 | 107 | 133 | 135 | 1 | 1 |
| | 118.7 | 132.0 | 1.5 | 1.5 | 32 | 109 | 141 | 145 | 1.5 | 1.5 |
| | 118.7 | 132.0 | 1.5 | 1.5 | 41 | 109 | 141 | 145 | 1.5 | 1.5 |
| **110** | 124.5 | 135.9 | 1.1 | 1.1 | 31 | 117 | 143 | 145 | 1 | 1 |
| | 124.5 | 135.9 | 1.1 | 1.1 | 40 | 117 | 143 | 145 | 1 | 1 |
| | 133.2 | 147.5 | 1.5 | 1.5 | 37 | 125 | 155 | 161 | 1.5 | 1.5 |
| | 133.2 | 147.5 | 1.5 | 1.5 | 47 | 125 | 155 | 161 | 1.5 | 1.5 |
| **120** | 136.5 | 149.0 | 1.1 | 1.1 | 34 | 127 | 158 | 160 | 1 | 1 |
| | 136.5 | 149.0 | 1.1 | 1.1 | 44 | 127 | 158 | 160 | 1 | 1 |
| | 143.2 | 157.5 | 1.5 | 1.5 | 39 | 135 | 165 | 172 | 1.5 | 1.5 |
| | 143.2 | 157.5 | 1.5 | 1.5 | 49 | 135 | 165 | 172 | 1.5 | 1.5 |

# Other SKF products and services

## High precision bearings

Machine tool applications require superior performance from the bearings used to support spindles and precision ball screws. They must exhibit this in terms of speed capability, system temperature stability, rigidity, accuracy and noise level; such characteristics are rarely met by bearings for general-purpose applications. Therefore, SKF produces special high-precision angular contact, angular contact thrust ball bearings and cylindrical roller bearings designed to satisfy the most demanding requirements in the machine tool environment.

*Publication 5002 “High precision bearings”*

## Precision spindles

With design and production in Italy, Gamfior; Germany, SKF Spindles; USA, Russel T. Gilman; and Japan, PSC Chino, SKF is a worldwide supplier of a complete range of spindles from externally driven to high speed motorised units. SKF spindles are mainly used in the metal cutting machine tool and woodworking industries, but applications are also found in printing, medical and factory automation.

*Publications 4990 “Grinding solutions”; 5346 “Compact spindle for milling”; 5348 “Woodworking spindle”*

## Spindle service

SKF is operating a worldwide network of Spindle Service Centres, where professional reconditioning of almost any machine tools spindle are handled. Service centres are presently located in Austria, France, Germany, India, Italy, Japan, Sweden, UK and the US. Services offered include from complete reconditioning, bearing replacement, shaft and nose restoration to performance upgrade and root cause analysis.

*Publication 5352 “SKF spindle service”.*

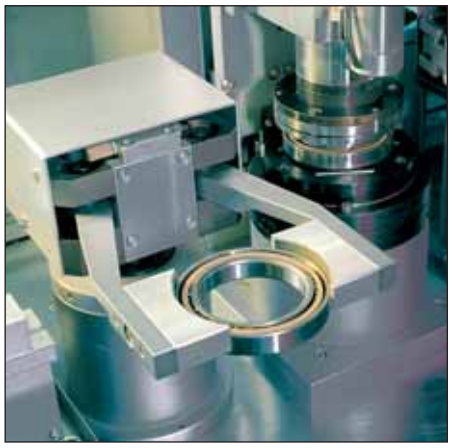
## Machine tool precision bearing service centres

SKF can help you in reducing downtime with three service centres located at Villar Perosa, Italy; Bethlehem, Pennsylvania (USA); Chino, Japan, to meet your precision machine tool bearings needs. These service centres provide custom preloaded and matched sets of high precision bearings, with very short turn-around. This translates into quicker deliveries, shorter lead times and reduced inventories.

*Publication 4808 E “SKF precision bearing service centres”.*





## SKF Bearings for general engineering applications

Deep groove ball bearings, angular contact ball bearings, cylindrical roller bearings, taper roller bearings, etc.

*SKF General Catalogue; also SKF Interactive Engineering Catalogue available on CD-ROM or on-line under www.skf.com*

## Linear motion products

SKF offers a wide range of rolled and ground ball screws for precision linear positioning systems and linear guides.

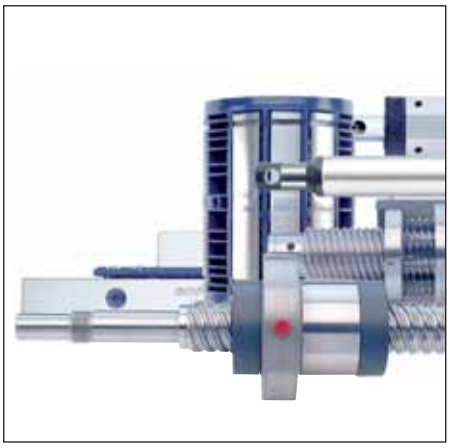
*Publication 4664/4 “Product range”, or on-line under www.linearmotion.SKF.com*

## Bearing greases, mounting tools and condition monitoring equipment

Rolling bearings are precision products, with dimensions in the order of microns (1/1000 of a millimetre) are of importance. Furthermore, they are reliable machine parts having a long service life, provided that mounting and maintenance are carried out properly. In order to ensure expert mounting and maintenance, SKF has developed a wide range of mounting and dismounting tools, measuring instruments, lubricating greases and auxiliary products. In special seminars, the users are made familiar with the necessary expert knowledge and receive training. The range includes: mechanical tools, heaters, hydraulic equipment, instruments, bearing lubricants and lubricators.
Condition monitoring solutions for measuring: temperature, speed and noise, oil cleanliness, vibration and bearing condition are also available.

*Publication MP3000 “SKF maintenance and lubrication products”.*





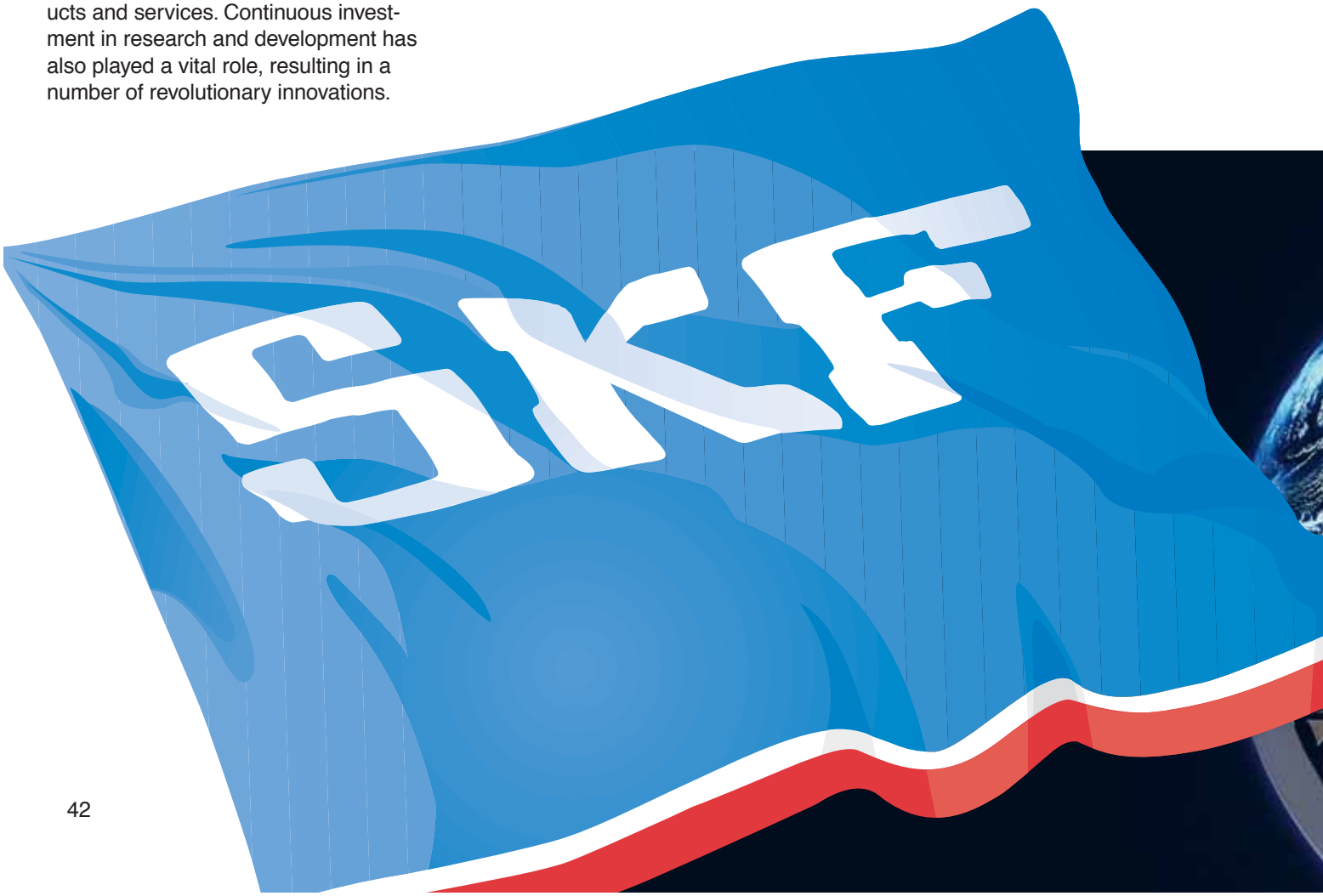


# The SKF Group – a worldwide corporation

SKF is an international industrial group operating in more than 130 countries and is a world leader in bearings. The company was founded in 1907 following the invention of the self-aligning ball bearing by Sven Wingquist and, after only a few years, SKF began to expand all over the world.

Today, SKF has about 40,000 employees and around 80 manufacturing facilities throughout the world. An international sales network includes a large number of sales companies and approximately 7,000 distributors. Worldwide availability of SKF products is supported by a comprehensive technical advisory service. The key to success has been a consistent emphasis on maintaining the highest quality products and services. Continuous investment in research and development has also played a vital role, resulting in a number of revolutionary innovations.

The business of the Group consists of bearings, seals, special steel and a comprehensive range of other high-tech industrial components. The experience gained in these various fields provides SKF with the essential knowledge and expertise required to provide customers with the most advanced engineering products and efficient service.





*The SKF group is the first major bearing manufacturer granted approval according to ISO 14001, the international standard for environmental management systems. The certificate is the most comprehensive of its kind and covers more than 60 SKF production units in 17 countries.*



*The SKF Engineering & Research Center is located just outside Utrecht in The Netherlands. In an area of 17,000 square meters (185,000 sq.ft.), some 150 scientists, engineers and support staff are engaged in the further improvement of bearing performance. They are developing technologies aimed at achieving better materials, better designs, better lubricants and better seals – together leading to an even better understanding of the operation of a bearing in its application. This is also the place where the SKF "Life Theory" evolved, enabling the design of bearings that are even more compact and offer even longer operational life.*



*SKF developed the "Channel" concept in factories all over the world, a concept that has drastically reduced the lead time from raw materials to end product as well as work in progress and finished goods in stock. The concept in action enables faster and smoother information flow, eliminates bottlenecks and bypasses unnecessary steps in production. Channel team members have the knowledge and commitment needed to share the responsibility for fulfilling objectives in areas such as quality, delivery time and production flow.*




*SKF manufactures ball bearings, roller bearings and plain bearings in a variety of sizes ranging from just a few millimeters in diameter to those measuring several meters. SKF also manufactures bearing and oil seals that prevent dirt from entering and lubricant from leaking out. SKF's subsidiaries CR and RFT S.p.A. are among the world's largest producers of seals.*

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