
SKF

CARB toroidal roller bearings

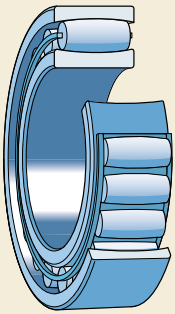
Designs

The CARB toroidal roller bearing is a completely new type of radial roller bearing (→ **fig. 1**). This compact self-aligning roller bearing was developed by SKF and introduced on the market in 1995. In a unique design, it combines the self-aligning capability of the spherical roller bearing with the unconstrained axial displacement ability of the cylindrical roller bearing. It can also have the compact cross section normally associated with the needle roller bearing.

The applicability of CARB bearings covers a wide range with regard to radial loads. They are intended exclusively as non-locating bearings and as such they are excellent with their combination of self-aligning and axial displacement properties, opening up completely new opportunities to save space, weight and production costs. By deliberately displacing the rings axially with respect to each other, it is possible to accurately set the radial internal clearance in the bearing.

CARB bearings permit smaller and lighter bearing arrangement designs, offering the same or improved performance in a particularly impressive manner, e.g. in planetary gearboxes. They simplify the bearing arrangement design for long shafts that are subjected to temperature variations. When using CARB bearings, it has also been proven that vibration levels are reduced, e.g. in paper machines or fans.

Fig. 1



The CARB bearing is a single row bearing with long, slightly crowned symmetrical rollers. The raceways of both the inner and outer rings are concave and situated symmetrically about the bearing centre. The attained optimal combination of both raceway profiles provides a favourable load distribution in the bearing, as well as low frictional running.

The rollers of the CARB bearing are self-guiding, i.e. they will always adopt the position where the load is evenly distributed over the roller length – irrespective of whether the inner ring is axially displaced and/or misaligned with respect to the outer ring.

The load carrying capacity of the CARB bearing is very high even when it has to compensate for angular misalignment or axial displacement. This results in an operationally reliable bearing arrangement with long service life.

Open bearings

CARB toroidal roller bearings are produced to two basic designs (→ **fig. 2**), depending on bearing size and series as

- bearings with cage (**a**)
- full complement bearings (**b**).

The load carrying capacity of the full complement CARB bearing is appreciably higher than that of the caged bearing. Both designs are available with a cylindrical bore as well as with a tapered bore. Depending on bearing series the tapered bore has a taper of either 1:12 (designation suffix K) or 1:30 (designation suffix K30).

Sealed bearings

Today, the range of sealed bearings (→ **fig. 3**) consists of small and medium size full complement bearings for low speeds. These bearings with seals on both sides are filled with a grease for high temperature and long life, and they are maintenance-free.

The double lip seal, suitable for high temperature operations, is sheet steel reinforced and made of hydrogenated acrylonitrile-butadiene rubber (HNBR). It seals against the inner ring raceway. The outside diameter of the seal is retained in an outer ring recess and provides proper sealing also in applications with outer ring rotation. The seals can withstand operating temperatures in the range of –40 and +150 °C.

The sealed bearings are filled with a premium quality grease, with a polyurea thickener and synthetic ester base oil. This grease has good corrosion inhibiting properties and has a temperature range of –25 to +180 °C[1]. The base oil viscosity is 440 mm^2/s at 40 °C and 38 mm^2/s at 100 °C. The grease fill is 70 to 100 % of the free space in the bearing. Sealed bearings with other lubricating greases or degrees of grease fill can be supplied on request.

Bearings for vibratory applications

For non-locating bearing positions in vibratory applications SKF manufactures CARB bearings with a surface hardened pressed steel cage in the C 23/C4VG114 series with a cylindrical bore. These bearings have the same dimensions and product data as the bearings in the C 23 series. They enable a press fit on the shaft to avoid possible fretting corrosion caused by a loose fit on the shaft. Using CARB bearings in vibratory applications on the non-locating side of the bearing arrangement will result in a self-aligning bearing system with better performance and reliability.

For additional information on CARB bearings in the C 23/C4VG114 series, please consult the SKF application engineering service.

SKF Explorer class bearings

All CARB bearings are manufactured to the SKF Explorer performance class.

[1] For safe operating temperature, → section "Temperature range – the SKF traffic light concept", starting on **page 232**

Fig. 2

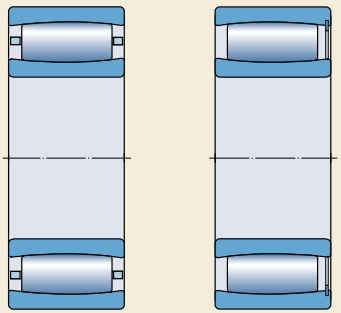
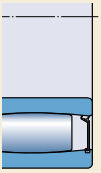


Fig. 3



Bearings on sleeves

CARB bearings with a tapered bore can be mounted on smooth or stepped shafts using

- an adapter sleeve (→ **fig. 4**), product table starting on **page 816**
- a withdrawal sleeve (→ **fig. 5**), product table starting on **page 826**.

Where appropriate, modified adapter sleeves (→ **fig. 6**) of the E, L and TL designs are available for CARB bearings, to prevent the locking device from chafing the adjacent cage:

- With the E-design sleeve, the standard KM lock nut and MB locking washer are replaced by a KMFE nut (**a**), and the standard lock nut HM 30 is replaced by an HME 30 nut with a recess at the outside diameter (**b**).
- The L-design sleeve differs from the standard design in that the standard KM lock nut and MB locking washer have been replaced by a KML nut and MBL locking washer; implying lower sectional height (**c**).
- With the TL-design sleeve, the standard HM .. T lock nut and MB locking washer have been replaced by the corresponding HM 30 nut and MS 30 locking clip; implying lower sectional height (**d**).

Where larger axial displacements can occur, it is recommended to observe the information in the section “Free space on the sides of the bearing” on **page 792**.

Fig. 4

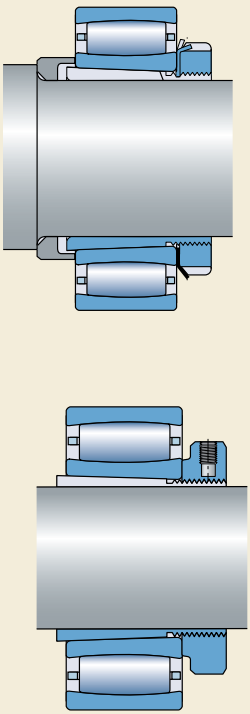


Fig. 5

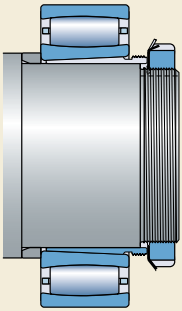
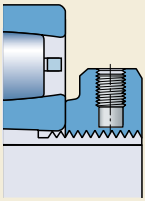
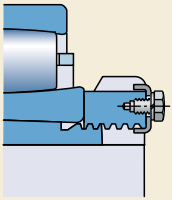


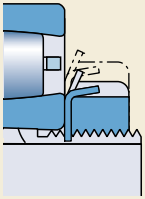
Fig. 6



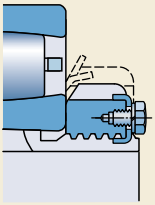
a



b



c



d

Appropriate bearing housings

The combination of a CARB bearing and an appropriate bearing housing constitutes an economic, interchangeable and reliable non-locating bearing arrangement, which fulfils the demands for easy maintenance. SKF standard housings are available for almost all CARB bearings of diameter series 0, 1, 2 and 3. Two bearing arrangement types are possible without requiring special measures:

- CARB bearing on an adapter sleeve and smooth shafts.
- CARB bearing on cylindrical seat and stepped shafts.

Detailed information on plummer (pillow) block housing in the SNL 2, 3, 5 and 6 series can be found in the section “Bearing housings”, starting on **page 1031**.

A brief description of all the SKF housings is also provided in the section “Bearing housings” where only main features are presented. Publications for detailed information are listed.

Bearing data – general

Dimensions

The boundary dimensions of CARB bearings are in accordance with ISO 15:1998. The dimensions of the adapter and withdrawal sleeves correspond to ISO 2982-1:1995.

Tolerances

SKF CARB bearings are manufactured as standard to Normal tolerances. Bearings up to and including 300 mm bore diameter are produced to higher precision than the ISO Normal tolerances. For example

- the width tolerance is considerably tighter than the ISO Normal tolerance; the tolerance is the same as for SKF Explorer spherical roller bearings (→ **table 2** on **page 704**)
- the running accuracy is to tolerance class P5 as standard.

For larger bearing arrangements where running accuracy is a key operational parameter, SKF CARB bearings with P5 running accuracy are also available. These bearings are identified by the suffix C08. Their availability should be checked.

The values of the tolerances are in accordance with ISO 492:2002 and can be found in **tables 3** to **5**, starting on **page 125**.

Internal clearance

CARB bearings are produced as standard with Normal radial internal clearance and most are also available with a larger C3 clearance. Many bearings can also be supplied with a smaller C2 clearance or with a much greater C4 or C5 clearance.

The radial internal clearance limits are listed for bearings with

- cylindrical bore in **table 1**
- tapered bore in **table 2**.

The limits are valid for bearings before mounting under zero measuring load, and with no axial displacement of one ring relative to the other.

Axial displacement of one ring relative to the other will gradually reduce the radial internal clearance in a CARB bearing. The amount of axial displacement encountered in cases without external heating of the shaft or foundation will have little effect on the radial internal clearance (→ section "Axial displacement", starting on **page 787**).

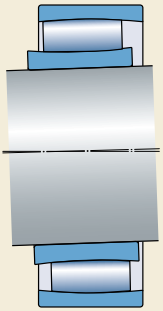
CARB bearings are often used together with spherical roller bearings. The clearance of the CARB bearing is slightly larger than that of the corresponding spherical roller bearing having the same clearance class. An axial displacement of the inner ring relative to the outer ring of 6 to 8 % of the bearing width will reduce the operational clearance to approximately the same value as a spherical roller bearing of the same size.

Misalignment

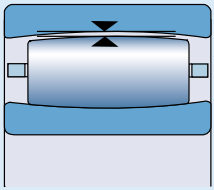
During operation, angular misalignment of up to 0,5° between the inner and outer rings (→ **fig. 7**) can usually be accommodated by a CARB bearing without any negative consequences for the bearing. However, misalignment values greater than 0,5° will increase friction and influence bearing service life. For misalignment greater than 0,5° please consult the SKF application engineering service. The ability to compensate for misalignment when the bearing is stationary is also limited. For CARB bearings with a machined brass cage centred on the inner ring, designation suffix MB, misalignment should never exceed 0,5°.

Misalignment displaces the rollers axially, causing them to approach the side faces of the

Fig. 7



Radial internal clearance of CARB bearings with a cylindrical bore

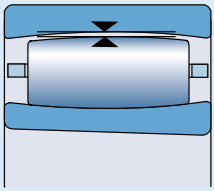


Bore diameter d		Radial internal clearance C2		Normal		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
mm		µm									
18	**24**	15	27	27	39	39	51	51	65	65	81
24	**30**	18	32	32	46	46	60	60	76	76	94
30	**40**	21	39	39	55	55	73	73	93	93	117
40	**50**	25	45	45	65	65	85	85	109	109	137
50	**65**	33	54	54	79	79	104	104	139	139	174
65	**80**	40	66	66	96	96	124	124	164	164	208
80	**100**	52	82	82	120	120	158	158	206	206	258
100	**120**	64	100	100	144	144	186	186	244	244	306
120	**140**	76	119	119	166	166	215	215	280	280	349
140	**160**	87	138	138	195	195	252	252	321	321	398
160	**180**	97	152	152	217	217	280	280	361	361	448
180	**200**	108	171	171	238	238	307	307	394	394	495
200	**225**	118	187	187	262	262	337	337	434	434	545
225	**250**	128	202	202	282	282	368	368	478	478	602
250	**280**	137	221	221	307	307	407	407	519	519	655
280	**315**	152	236	236	330	330	434	434	570	570	714
315	**355**	164	259	259	360	360	483	483	620	620	789
355	**400**	175	280	280	395	395	528	528	675	675	850
400	**450**	191	307	307	435	435	577	577	745	745	929
450	**500**	205	335	335	475	475	633	633	811	811	1 015
500	**560**	220	360	360	518	518	688	688	890	890	1 110
560	**630**	245	395	395	567	567	751	751	975	975	1 215
630	**710**	267	435	435	617	617	831	831	1 075	1 075	1 335
710	**800**	300	494	494	680	680	920	920	1 200	1 200	1 480
800	**900**	329	535	535	755	755	1 015	1 015	1 325	1 325	1 655
900	**1 000**	370	594	594	830	830	1 120	1 120	1 460	1 460	1 830
1 000	**1 120**	410	660	660	930	930	1 260	1 260	1 640	1 640	2 040
1 120	**1 250**	450	720	720	1 020	1 020	1 380	1 380	1 800	1 800	2 240

Please refer to **page 137** for the definition of radial internal clearance

Table 2

Radial internal clearance of CARB bearings with a tapered bore



Bore diameter d		Radial internal clearance C2		Normal		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
mm		µm									
18	**24**	19	31	31	43	43	55	55	69	69	85
24	**30**	23	37	37	51	51	65	65	81	81	99
30	**40**	28	46	46	62	62	80	80	100	100	124
40	**50**	33	53	53	73	73	93	93	117	117	145
50	**65**	42	63	63	88	88	113	113	148	148	183
65	**80**	52	78	78	108	108	136	136	176	176	220
80	**100**	64	96	96	132	132	172	172	218	218	272
100	**120**	75	115	115	155	155	201	201	255	255	321
120	**140**	90	135	135	180	180	231	231	294	294	365
140	**160**	104	155	155	212	212	269	269	338	338	415
160	**180**	118	173	173	238	238	301	301	382	382	469
180	**200**	130	193	193	260	260	329	329	416	416	517
200	**225**	144	213	213	288	288	363	363	460	460	571
225	**250**	161	235	235	315	315	401	401	511	511	635
250	**280**	174	258	258	344	344	444	444	556	556	692
280	**315**	199	283	283	377	377	481	481	617	617	761
315	**355**	223	318	318	419	419	542	542	679	679	848
355	**400**	251	350	350	471	471	598	598	751	751	920
400	**450**	281	383	383	525	525	653	653	835	835	1 005
450	**500**	305	435	435	575	575	733	733	911	911	1 115
500	**560**	335	475	475	633	633	803	803	1 005	1 005	1 225
560	**630**	380	530	530	702	702	886	886	1 110	1 110	1 350
630	**710**	422	590	590	772	772	986	986	1 230	1 230	1 490
710	**800**	480	674	674	860	860	1 100	1 100	1 380	1 380	1 660
800	**900**	529	735	735	955	955	1 215	1 215	1 525	1 525	1 855
900	**1 000**	580	814	814	1 040	1 040	1 340	1 340	1 670	1 670	2 050
1 000	**1 120**	645	895	895	1 165	1 165	1 495	1 495	1 875	1 875	2 275
1 120	**1 250**	705	975	975	1 275	1 275	1 635	1 635	2 055	2 055	2 495

Please refer to **page 137** for the definition of radial internal clearance

bearing rings. Therefore, possible axial displacement should be reduced (→ section "Axial displacement").

Axial displacement

CARB toroidal roller bearings can accommodate axial displacement of the shaft relative to the housing within the bearing. The axial displacement can result from thermal expansion or deviations from determined bearing positions.

Misalignment as well as axial displacement influences the axial position of the rollers in a CARB bearing. Axial displacement also reduces the radial clearance. SKF recommends checking that the axial displacement is within acceptable limits, i.e. the residual clearance is great enough, and that the rollers do not protrude outside the side face of a ring (→ **fig. 8a**) or contact any locking ring (→ **fig. 8b**) or seal. To accommodate the displacement of the roller and cage assembly, provide free space on both sides of the bearing as described in the section "Free space on the sides of the bearing" on **page 792**.

The axial displacement from the normal position of one bearing ring in relation to the other is limited by

- the displacement of the roller set, or by
- the reduction of clearance.

The maximum possible axial displacement is obtained from the smaller of these two limitations.

Limitation caused by the displacement of the roller set

The guideline values s_1 and s_2 for axial displacement (→ **fig. 8**) shown in the product tables are valid, provided

- there is a sufficiently large operational radial clearance in the bearing before shaft elongation, and
- the rings are not misaligned.

The reduction in the possible axial displacement caused by misalignment can be estimated using

$$s_{mis} = k_1 B \alpha$$

where

s_{mis} = reduction in axial displacement caused by misalignment, mm
k_1 = misalignment factor (→ product tables)
B = bearing width, mm (→ product tables)
α = misalignment, degrees

Assuming a sufficiently large operational clearance, the maximum possible axial displacement is obtained from

$$s_{lim} = s_1 - s_{mis}$$

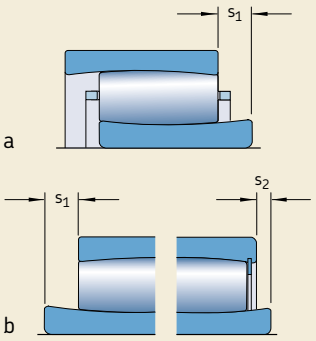
or

$$s_{lim} = s_2 - s_{mis}$$

where

s_{lim} = possible axial displacement relative to the movement of the roller set caused by misalignment, mm
s_1 = guideline value for the axial displacement capability in bearings with a cage or in full complement bearings when displacing away from the snap ring, mm (→ product tables)
s_2 = guideline value for the axial displacement capability in sealed or full complement bearings when displacing towards the seal or snap ring respectively, mm (→ product tables)
s_{mis} = reduction in axial displacement caused by misalignment, mm

Fig. 8



Limitation caused by the reduction of clearance

The radial clearance reduction corresponding to axial displacement from a centred position can be calculated using

$$C_{red} = \frac{k_2 \, s_{cle}^2}{B}$$

In cases where the reduction of the clearance is greater than the radial clearance before shaft elongation, the bearing will be preloaded. If instead a certain radial clearance reduction is known, the corresponding axial displacement from a centred position can be calculated using

$$s_{cle} = \sqrt{\frac{B \, C_{red}}{k_2}}$$

where

s_{cle} = axial displacement from a centred position, corresponding to a certain radial clearance reduction, mm
C_{red} = reduction of radial clearance as a result of an axial displacement from a centred position, mm
k_2 = operating clearance factor (→ product tables)
B = bearing width, mm (→ product tables)

The axial displacement capability can also be obtained using **diagram 1**, which is valid for all CARB bearings. The axial displacement and radial clearance are shown as functions of the bearing width.

From **diagram 1** it can be seen (dotted line) that for a bearing C 3052 K/HA3C4, for an operational clearance of 0,15 mm which corresponds to approximately 0,15 % of the bearing width, an axial displacement of approximately 12 % of the bearing width is possible. Thus, when an axial displacement of approximately 0,12 × 104 = 12,5 mm has taken place, the operational clearance will be zero.

It should be remembered that the distance between the dotted line and the curve represents the residual radial operating clearance in the bearing arrangement.

Diagram 1 also illustrates how it is possible, simply by axially displacing the bearing rings relative to each other, to achieve a given radial internal clearance in a CARB bearing.

Calculation example 1

For bearing C 3052, having

- a width B = 104 mm
- a misalignment factor k_1 = 0,122
- a value for the axial displacement s_1 = 19,3,

with an angular misalignment of α = 0,3° between the inner and outer ring, the permissible axial displacement can be obtained from

$$s_{lim} = s_1 - s_{mis}$$
$$s_{lim} = s_1 - k_1 \, B \, \alpha$$
$$s_{lim} = 19{,}3 - 0{,}122 \times 104 \times 0{,}3 = 19{,}3 - 3{,}8$$
$$s_{lim} = 15{,}5 \text{ mm}$$

Calculation example 2

For bearing C 3052 K/HA3C4, having

- a width B = 104 mm
- an operating clearance factor k_2 = 0,096
- an operational clearance of 0,15 mm,

the possible axial displacement from the central position of one ring to the other until the operational clearance equals zero can be obtained from

$$s_{cle} = \sqrt{\frac{B \, C_{red}}{k_2}}$$

$$s_{cle} = \sqrt{\frac{104 \times 0{,}15}{0{,}096}}$$

$$s_{cle} = 12{,}7 \text{ mm}$$

The axial displacement of 12,7 mm is below the limiting value s_1 = 19,3 mm, shown in the product table. An operating misalignment of 0,3° is also permissible, see also example 1.

Calculation example 3

For bearing C 3052, which has a width B = 104 mm and an operating clearance factor k_2 = 0,096, the reduction in operational clearance caused by an axial displacement s_{cle} = 6,5 mm from the central position is calculated using

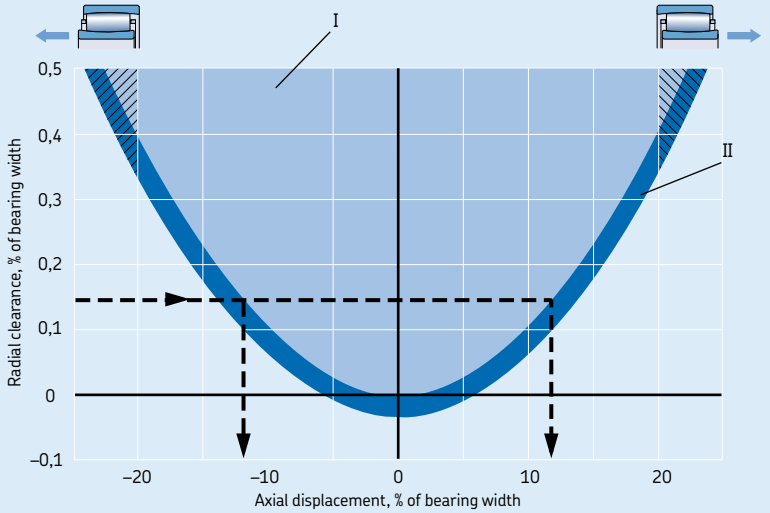
$$C_{red} = \frac{k_2 \, s_{cle}^2}{B}$$

$$C_{red} = \frac{0{,}096 \times 6{,}5^2}{104}$$

$$C_{red} = 0{,}039 \text{ mm}$$

Diagram 1

Axial displacement in % of the bearing width



I Range of operation with operational clearance
II Possible range of operation where the bearing will have preload and the friction can increase by up to 50 % but where the L_{10} bearing life will still be achieved

Influence of operating temperature on bearing material

All CARB bearings undergo a special heat treatment so that they can be operated at higher temperatures for longer periods, without the occurrence of inadmissible dimensional changes, provided the permissible operating temperature of the cage is not exceeded, for example, a temperature of +200 °C for 2 500 h, or for short periods at even higher temperatures.

Cages

When the bearing is not of the full complement design, depending upon size, CARB bearings are fitted as standard with one of the following cages (→ **fig. 9**)

- an injection moulded window-type cage of glass fibre reinforced polyamide 4,6, roller centred, designation suffix TN9 (**a**)
- a pressed window-type steel cage, roller centred, no designation suffix (**b**)
- a machined window-type brass cage, roller centred, designation suffix M (**c**)
- a two-piece machined brass cage, inner ring centred, designation suffix MB (**d**).

Note

CARB bearings with polyamide 4,6 cages can be operated continuously at temperatures up to +130 °C. The lubricants generally used for rolling bearings do not have a detrimental effect on cage properties, with the exception of a few synthetic oils and greases with a synthetic oil base, and lubricants containing a high proportion of EP additives when used at high temperatures.

For bearing arrangements, which are to be operated at continuously high temperatures or under arduous conditions, it is recommended to use bearings with steel or brass cage. Full complement bearings might also be a possible alternative.

For detailed information about the temperature resistance and the applicability of cages, please refer to the section “Cage materials”, starting on **page 140**.

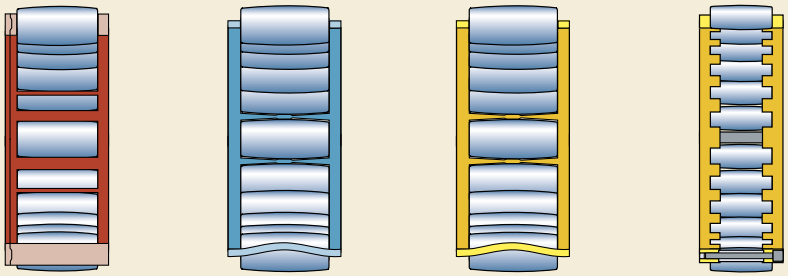
Minimum load

In order to provide satisfactory operation, CARB bearings, like all ball and roller bearings, must always be subjected to a given minimum load, particularly if they are to operate at high speeds or are subjected to high accelerations or rapid changes in the direction of load. Under such conditions, the inertia forces of the rollers and cage, and the friction in the lubricant, can have a detrimental effect on the rolling conditions in the bearing arrangement and may cause damaging sliding movements to occur between the rollers and raceways.

The requisite minimum load to be applied to a CARB bearing with cage can be estimated using

$$F_{rm} = 0{,}007\ C_0$$

Fig. 9



and for a full complement bearing using

$$F_{rm} = 0{,}01\ C_0$$

where
F_{rm} = minimum radial bearing load, kN
C_0 = basic static load rating, kN
(→ product tables)

In some applications it is not possible to reach or exceed the requisite minimum load. However, for caged bearings that are oil lubricated, lower minimum loads are permissible. These loads can be calculated when $n/n_r \leq 0{,}3$ from

$$F_{rm} = 0{,}002\ C_0$$

and when $0{,}3 < n/n_r \leq 2$ from

$$F_{rm} = 0{,}003\ C_0 \left(1+2\sqrt{\frac{n}{n_r} - 0{,}3}\right)$$

where
F_{rm} = minimum radial bearing load, kN
C_0 = basic static load rating, kN
(→ product tables)
n = rotational speed, r/min
n_r = reference speed, r/min
(→ product tables)

When starting up at low temperatures or when the lubricant is highly viscous, even greater minimum loads than $F_{rm} = 0{,}007\ C_0$ and $0{,}01\ C_0$ respectively may be required. The weight of the components supported by the bearing, together with external forces, generally exceeds the requisite minimum load. If this is not the case, the CARB bearing must be subjected to an additional radial load.

Equivalent dynamic bearing load

As the CARB bearing can only accommodate radial loads

$$P = F_r$$

Equivalent static bearing load

As the CARB bearing can only accommodate radial loads

$$P_0 = F_r$$

Supplementary designations

The designation suffixes used to identify certain features of CARB bearings are explained in the following.

C2 Radial internal clearance smaller than Normal
C3 Radial internal clearance larger than Normal
C4 Radial internal clearance larger than C3
C5 Radial internal clearance larger than C4
CS5 Sheet steel reinforced contact seal of hydrogenated acrylonitrile-butadiene rubber (HNBR) on one side of the bearing
2CS5 CS5 contact seal on both sides of the bearing. Free space in the bearing filled between 70 and 100 % with a high-temperature grease
HA3 Case-hardened inner ring
K Tapered bore, taper 1:12
K30 Tapered bore, taper 1:30
M Machined window-type brass cage, roller centred
MB Two-piece machined brass cage, inner ring centred
TN9 Injection moulded window-type cage of glass fibre reinforced polyamide 4,6, roller centred
V Full complement of rollers (no cage)
VE240 Bearing modified for greater axial displacement
VG114 Surface hardened steel cage, roller centred

Free space on the sides of the bearing

To enable axial displacement of the shaft with respect to the housing it is necessary to provide free space on both sides of the bearing as indicated in **fig. 10**. The value for the width of this free space is based on

- the value C_a from the product tables
- the axial displacement of the bearing rings from the central position expected in operation
- the displacement of the rings caused by misalignment.

It can be obtained from

$$C_{areq} = C_a + 0{,}5\,(s + s_{mis})$$

or

$$C_{areq} = C_a + 0{,}5\,(s + k_1\,B\,\alpha)$$

where

C_{areq} = width of space required on each side of the bearing, mm
C_a = minimum width of space required on each side of the bearing, mm (→ product tables)
s = relative axial displacement of rings, e.g. thermal elongation of shaft, mm
s_{mis} = axial displacement of roller complement caused by misalignment, mm
k_1 = misalignment factor (→ product tables)
B = bearing width, mm (→ product tables)
α = misalignment, degrees

See also the section “Axial displacement” on **page 787**.

Normally the bearing rings are mounted so that they are not displaced with respect to each other. However, if considerable thermal changes in shaft length can be expected, the inner ring can be mounted offset with respect to the outer ring up to the permissible axial displacement s_1 or s_2 in the direction opposite to the expected thermal elongation (→ **fig. 11**). In this way, the permissible axial displacement can be appreciably extended, an advantage that is made use of for example in the bearing arrangements of drying cylinders in paper machines.

Mounting

When mounting a CARB bearing onto a shaft or in a housing, both bearing rings and the roller complement must be centred with respect to each other. For this reason SKF recommends mounting CARB bearings when the shaft or housing is in the horizontal position.

When mounting a CARB bearing onto a vertical shaft or into a vertical housing, the roller complement together with the inner or outer ring will move downwards until all clearance has been removed. Unless proper clearance is maintained

Fig. 10

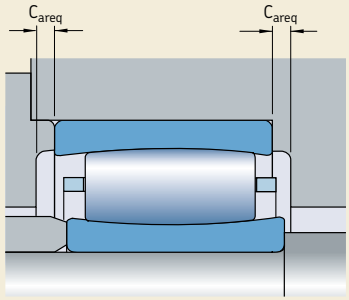
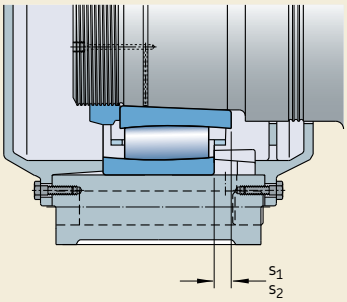


Fig. 11



during and after installation, the expansion or compression forces resulting from an interference fit on either the inner or outer ring will create a preload. This preload can cause indentations in the raceways and/or prevent the bearing from turning altogether. To prevent this preload condition from occurring during vertical mounting, a bearing-handling tool, which keeps the bearing components centred, should be used.

Mounting bearings with a tapered bore

Bearings with a tapered bore are always mounted with an interference fit. The reduction in radial internal clearance, or the axial displacement of the inner ring on its tapered seat is used as a measure of the degree of interference.

Suitable methods for mounting CARB bearings with a tapered bore are:

- Measuring the clearance reduction.
- Measuring the lock nut tightening angle.
- Measuring the axial drive-up.
- Measuring the inner ring expansion.

Small bearings with bore diameter up to 100 mm can be properly mounted by measuring the lock nut tightening angle.

For larger bearings the SKF Drive-up Method is recommended. This method is more accurate and takes less time than the procedure based on clearance reduction or the lock nut tightening angle. Measuring the inner ring expansion, i.e. applying the SensorMount Method, enables large size bearings to be mounted simply, quickly and accurately, since a sensor is integrated into the bearing inner ring.

Measuring the clearance reduction

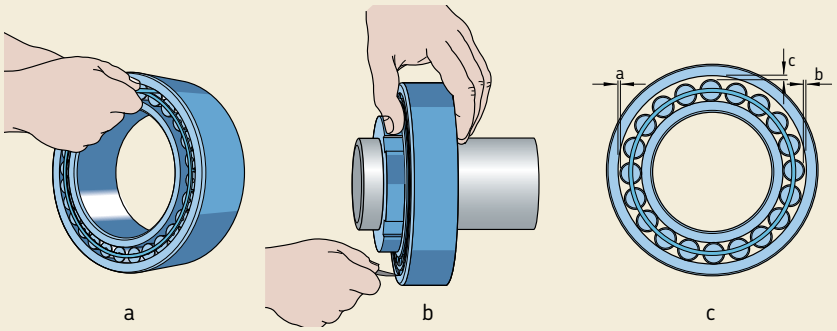
This method, which uses feeler gauges for measuring the radial internal clearance before and after mounting bearings, is applicable for medium and large-sized bearings (**→ fig. 12**). Before measuring, rotate the outer ring a few times. Make sure that both bearing rings and the roller complement are centrically arranged with respect to each other.

For the first measurement, a blade should be selected which is slightly thinner than the minimum value for the clearance. During the measurement, the blade should be moved back and forth until it can be inserted to the middle of the roller. The procedure should be repeated using slightly thicker blades each time until a certain resistance is felt when moving between

- outer ring and uppermost roller (**a**) – before mounting
- inner or outer ring and lowest roller (**b**) depending on the cage – after mounting.

For larger bearings, especially those having a rather thin-walled outer ring, the measurements may be affected by the elastic deformation of the rings, caused by the weight of the bearing or the force to draw the feeler gauge blade through the gap between the raceway and an unloaded roller. To establish in such cases the

Fig. 12

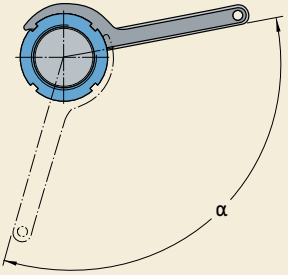


"true" clearance before and after mounting, the following procedure should be followed (**c**):

- Measure the clearance "c" at the 12 o'clock position for a standing bearing or at the 6 o'clock position for a bearing hanging on a journal.
- Measure clearances "a" at the 9 o'clock position and "b" at the 3 o'clock position without the bearing being moved.
- Obtain the "true" radial internal clearance with relatively good accuracy from 0,5 (a + b + c).

Recommended values for reduction of radial internal clearance are provided in **table 3**.

Fig. 13



Measuring the lock nut tightening angle

Mounting small to medium-size bearings on tapered seats is easy when the tightening angle α of the lock nut (→ **fig. 13**) and the method that is described in the following is used. Recommended values for the tightening angle α are provided in **table 3**.

Before starting the final tightening procedure, the bearing should be pushed up on the tapered seat until the bore of the bearing or sleeve is in contact with the seat on the shaft around its whole circumference, i.e. the bearing inner ring cannot be rotated relatively to the shaft. By then turning the nut through the given angle α, the bearing will be pressed up the tapered seat. The residual clearance of the bearing should be checked, if possible.

Lock the nut by tightening the grub screw with the recommended tightening torque or by bending one of the locking washer tabs into one of the nut slots respectively.

Measuring the axial drive-up

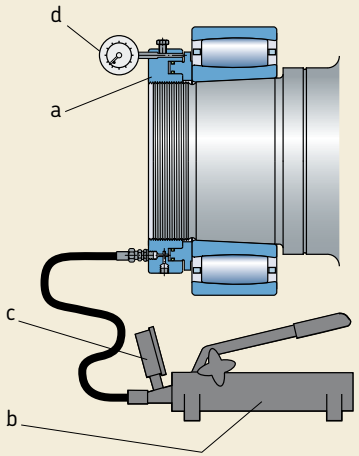
Mounting bearings with a tapered bore can be done by measuring the axial drive-up of the inner ring on its seat. Recommended values for the required axial drive-up "s" for general applications are provided in **table 3**.

The most suitable method in this case is the SKF Drive-up Method. This mounting method provides a very reliable and easy way to determine the starting position for a bearing from which the axial displacement is to be measured.

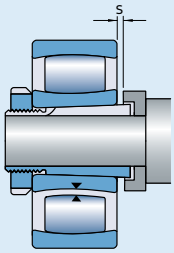
For that, the following mounting tools (→ **fig. 14**) must be used

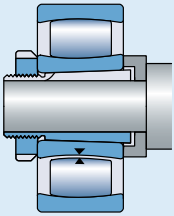
- an SKF hydraulic nut of the HMV .. E design (**a**)
- a hydraulic pump (**b**)
- a pressure gauge (**c**), appropriate to the mounting conditions
- a dial gauge (**d**).

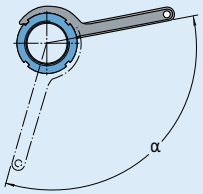
Fig. 14



Recommended values for reduction of radial internal clearance, axial drive-up and lock nut tightening angle







Bore diameter d		Reduction of radial internal clearance		Axial drive-up[1] s				Residual[2] radial clearance after mounting bearings with initial clearance			Lock nut tightening angle α
				Taper 1:12		Taper 1:30					
over	incl.	min	max	min	max	min	max	Normal	C3	C4	Taper 1:12
mm		mm		mm				mm			degrees
24	**30**	0,012	0,018	0,25	0,34	0,64	0,85	0,025	0,033	0,047	100
30	**40**	0,015	0,024	0,30	0,42	0,74	1,06	0,031	0,038	0,056	115
40	**50**	0,020	0,030	0,37	0,51	0,92	1,27	0,033	0,043	0,063	130
50	**65**	0,025	0,039	0,44	0,64	1,09	1,59	0,038	0,049	0,074	115
65	**80**	0,033	0,048	0,54	0,76	1,36	1,91	0,041	0,055	0,088	135
80	**100**	0,040	0,060	0,65	0,93	1,62	2,33	0,056	0,072	0,112	150
100	**120**	0,050	0,072	0,79	1,10	1,98	2,75	0,065	0,083	0,129	–
120	**140**	0,060	0,084	0,93	1,27	2,33	3,18	0,075	0,106	0,147	–
140	**160**	0,070	0,096	1,07	1,44	2,68	3,60	0,085	0,126	0,173	–
160	**180**	0,080	0,108	1,21	1,61	3,04	4,02	0,093	0,140	0,193	–
180	**200**	0,090	0,120	1,36	1,78	3,39	4,45	0,100	0,150	0,210	–
200	**225**	0,100	0,135	1,50	1,99	3,74	4,98	0,113	0,163	0,230	–
225	**250**	0,115	0,150	1,67	2,20	4,18	5,51	0,123	0,175	0,250	–
250	**280**	0,125	0,170	1,85	2,46	4,62	6,14	0,133	0,186	0,275	–
280	**315**	0,140	0,190	2,06	2,75	5,15	6,88	0,143	0,200	0,290	–
315	**355**	0,160	0,215	2,31	3,09	5,77	7,73	0,161	0,225	0,330	–
355	**400**	0,175	0,240	2,59	3,47	6,48	8,68	0,173	0,250	0,360	–
400	**450**	0,200	0,270	2,91	3,90	7,27	9,74	0,183	0,275	0,385	–
450	**500**	0,225	0,300	3,26	4,32	8,15	10,8	0,210	0,295	0,435	–
500	**560**	0,250	0,335	3,61	4,83	9,04	12,1	0,225	0,325	0,465	–
560	**630**	0,280	0,380	4,04	5,42	10,1	13,6	0,250	0,365	0,510	–
630	**710**	0,315	0,425	4,53	6,10	11,3	15,3	0,275	0,385	0,560	–
710	**800**	0,355	0,480	5,10	6,86	12,7	17,2	0,320	0,430	0,620	–
800	**900**	0,400	0,540	5,73	7,71	14,3	19,3	0,335	0,465	0,675	–
900	**1 000**	0,450	0,600	6,44	8,56	16,1	21,4	0,365	0,490	0,740	–
1 000	**1 120**	0,500	0,670	7,14	9,57	17,9	23,9	0,395	0,545	0,825	–
1 120	**1 250**	0,560	0,750	8	10,7	20	26,7	0,415	0,595	0,885	–

[1] Valid only for solid steel shafts and general application. Not valid for the SKF Drive-up Method
[2] The residual clearance must be checked in cases where the initial radial internal clearance is in the lower half of the tolerance range, and where large temperature differentials between the bearing rings can arise in operation. When measuring, make sure that the rings and roller assembly are aligned and centred

Applying the SKF Drive-up Method, the bearing is pushed up its seat to a defined starting position (→ **fig. 15**) using a given oil pressure (corresponding to a given drive-up force) in the hydraulic nut. In this way, part of the desired reduction in radial internal clearance is achieved. The oil pressure is monitored by the pressure gauge. The bearing is then driven up from the defined starting position through a given distance to its final position. The axial displacement "s_s" is accurately determined using the dial gauge mounted on the hydraulic nut.

SKF has determined values of the requisite oil pressure and the axial displacement for individual bearings. These values apply to bearing arrangements (→ **fig. 16**) with

- one sliding interface (**a** and **b**) or
- two sliding interfaces (**c**).

Fig. 15

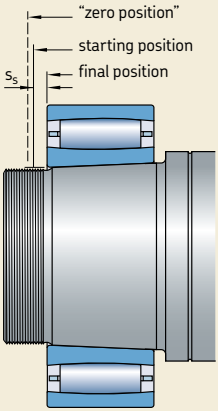
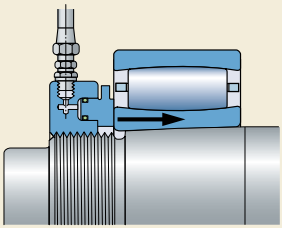
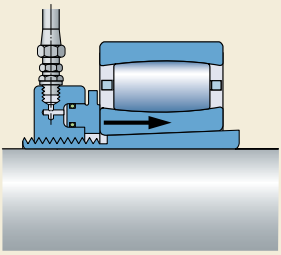


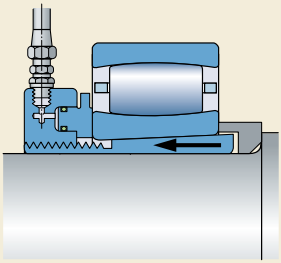
Fig. 16



a



b



c

Measuring the inner ring expansion

Measuring inner ring expansion enables large size CARB bearings with a tapered bore to be mounted simply, quickly and accurately without measuring the radial internal clearance before and after mounting. The SensorMount Method uses a sensor, integrated into the CARB bearing inner ring, and a dedicated hand-held indicator (→ **fig. 17**).

The bearing is driven up the tapered seat using common SKF mounting tools. The information from the sensor is processed by the indicator. Inner ring expansion is displayed as the relationship between the clearance reduction (mm) and the bearing bore diameter (m).

Aspects like bearing size, smoothness, shaft material or design – solid or hollow – do not need to be considered.

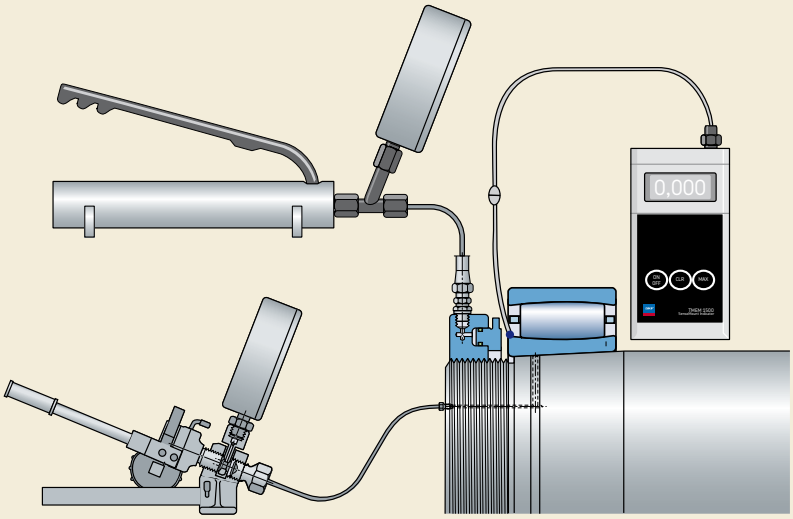
For detailed information about the SensorMount Method, please contact the SKF application engineering service.

Additional mounting information

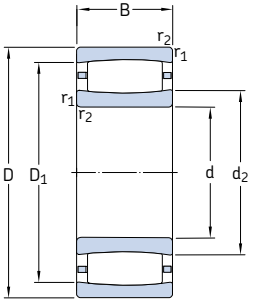
Additional information on mounting CARB bearings in general or with the aid of the SKF Drive-up Method can be found

- in the handbook "SKF Drive-up Method" on CD-ROM
- in the "SKF Interactive Engineering Catalogue" on CD-ROM or online at www.skf.com
- online at www.skf.com/mount.

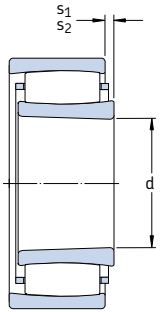
Fig. 17



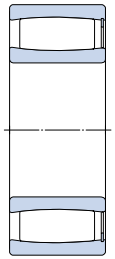
CARB toroidal roller bearings
d **25 – 55** mm



Cylindrical bore



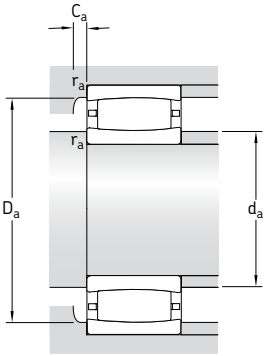
Tapered bore



Full complement

Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designations Bearing with cylindrical bore	tapered bore
d	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
25	52	18	44	40	4,55	13 000	18 000	0,17	✱ **C 2205 TN9**[1]	✱ **C 2205 KTN9**[1]
	52	18	50	48	5,5	–	7 000	0,18	✱ **C 2205 V**[1]	✱ **C 2205 KV**[1]
30	55	45	134	180	19,6	–	3 000	0,50	✱ **C 6006 V**	–
	62	20	69,5	62	7,2	11 000	15 000	0,27	✱ **C 2206 TN9**	✱ **C 2206 KTN9**
	62	20	76,5	71	8,3	–	6 000	0,29	✱ **C 2206 V**	✱ **C 2206 KV**
35	72	23	83	80	9,3	9 500	13 000	0,43	✱ **C 2207 TN9**	✱ **C 2207 KTN9**
	72	23	95	96,5	11,2	–	5 000	0,45	✱ **C 2207 V**	✱ **C 2207 KV**
40	62	22	76,5	100	11	–	4 300	0,25	✱ **C 4908 V**	✱ **C 4908 K30V**
	62	30	104	143	16	–	3 400	0,35	✱ **C 5908 V**[1]	–
	62	40	122	180	19,3	–	2 800	0,47	✱ **C 6908 V**[1]	–
	80	23	90	86,5	10,2	8 000	11 000	0,50	✱ **C 2208 TN9**	✱ **C 2208 KTN9**
	80	23	102	104	12	–	4 500	0,53	✱ **C 2208 V**	✱ **C 2208 KV**
45	68	22	81,5	112	12,9	–	3 800	0,30	✱ **C 4909 V**[1]	✱ **C 4909 K30V**[1]
	68	30	110	163	18,3	–	3 200	0,41	✱ **C 5909 V**[1]	–
	68	40	132	200	22	–	2 600	0,55	✱ **C 6909 V**[1]	–
	85	23	93	93	10,8	8 000	11 000	0,55	✱ **C 2209 TN9**	✱ **C 2209 KTN9**
	85	23	106	110	12,9	–	4 300	0,58	✱ **C 2209 V**	✱ **C 2209 KV**
50	72	22	86,5	125	13,7	–	3 600	0,29	✱ **C 4910 V**	✱ **C 4910 K30V**
	72	30	118	180	20,4	–	2 800	0,42	✱ **C 5910 V**[1]	–
	72	40	140	224	24,5	–	2 200	0,54	✱ **C 6910 V**	–
	80	30	116	140	16	5 000	7 500	0,55	✱ **C 4010 TN9**	✱ **C 4010 K30TN9**
	80	30	137	176	20	–	3 000	0,59	✱ **C 4010 V**	✱ **C 4010 K30V**
	90	23	98	100	11,8	7 000	9 500	0,59	✱ **C 2210 TN9**	✱ **C 2210 KTN9**
	90	23	114	122	14,3	–	3 800	0,62	✱ **C 2210 V**	✱ **C 2210 KV**
55	80	25	106	153	18	–	3 200	0,43	✱ **C 4911 V**[1]	✱ **C 4911 K30V**[1]
	80	34	143	224	25	–	2 600	0,60	✱ **C 5911 V**[1]	–
	80	45	180	300	32,5	–	2 000	0,81	✱ **C 6911 V**[1]	–
	100	25	116	114	13,4	6 700	9 000	0,79	✱ **C 2211 TN9**	✱ **C 2211 KTN9**
	100	25	132	134	16	–	3 400	0,81	✱ **C 2211 V**	✱ **C 2211 KV**

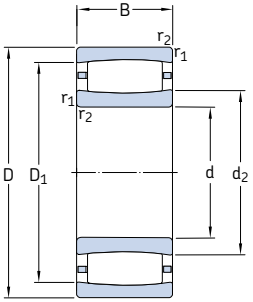
✱ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



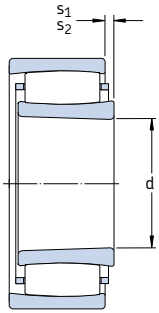
Dimensions						Abutment and fillet dimensions						Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_1[1] ~	s_2[1] ~	d_a min	d_a max	D_a min	D_a max	C_a[2] min	r_a max	k_1	k_2
mm						mm						–	
25	32,1	43,3	1	5,8	–	30,6	32	42	46,4	0,3	1	0,09	0,126
	32,1	43,3	1	5,8	2,8	30,6	39	–	46,4	–	1	0,09	0,126
30	38,5	47,3	1	7,9	4,9	35,6	43	–	49,4	–	1	0,102	0,096
	37,4	53,1	1	4,5	–	35,6	37	51	56,4	0,3	1	0,101	0,111
	37,4	53,1	1	4,5	1,5	35,6	49	–	56,4	–	1	0,101	0,111
35	44,8	60,7	1,1	5,7	–	42	44	59	65	0,1	1	0,094	0,121
	44,8	60,7	1,1	5,7	2,7	42	57	–	65	–	1	0,094	0,121
40	46,1	55,3	0,6	4,7	1,7	43,2	52	–	58,8	–	0,6	0,099	0,114
	45,8	54,6	0,6	5	2	43,2	45	–	58,8	–	0,6	0,096	0,106
	46,6	53,8	0,6	9,4	6,4	43,2	46	–	58,8	–	0,6	0,113	0,088
	52,4	69,9	1,1	7,1	–	47	52	68	73	0,3	1	0,093	0,128
	52,4	69,9	1,1	7,1	4,1	47	66	–	73	–	1	0,093	0,128
45	51,6	60,5	0,6	4,7	1,7	48,2	51	–	64,8	–	0,6	0,114	0,1
	51,3	60,1	0,6	5	2	48,2	51	–	64,8	–	0,6	0,096	0,108
	52,1	59,3	0,6	9,4	6,4	48,2	52	–	64,8	–	0,6	0,113	0,09
	55,6	73,1	1,1	7,1	–	52	55	71	78	0,3	1	0,095	0,128
	55,6	73,1	1,1	7,1	4,1	52	69	–	78	–	1	0,095	0,128
50	56,9	66,1	0,6	4,7	1,7	53,2	62	–	68,8	–	0,6	0,103	0,114
	56,8	65,7	0,6	5	2	53,2	56	–	68,8	–	0,6	0,096	0,11
	57,5	65	0,6	9,4	6,4	53,2	61	–	68,8	–	0,6	0,093	0,113
	57,6	70,8	1	6	–	54,6	57	70	75,4	0,1	1	0,103	0,107
	57,6	70,8	1	6	3	54,6	67	–	75,4	–	1	0,103	0,107
	61,9	79,4	1,1	7,1	–	57	61	77	83	0,8	1	0,097	0,128
	61,9	79,4	1,1	7,1	3,9	57	73	–	83	–	1	0,097	0,128
55	62	72,1	1	5,5	2,5	59,6	62	–	80,4	–	1	0,107	0,105
	62,8	72,4	1	6	3	59,6	62	–	80,4	–	1	0,097	0,109
	62,8	71,3	1	7,9	4,9	59,6	62	–	80,4	–	1	0,096	0,105
	65,8	86,7	1,5	8,6	–	64	65	84	91	0,3	1,5	0,094	0,133
	65,8	86,7	1,5	8,6	5,4	64	80	–	91	–	1,5	0,094	0,133

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

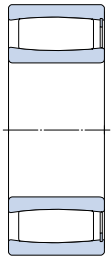
CARB toroidal roller bearings
d **60 – 85** mm



Cylindrical bore



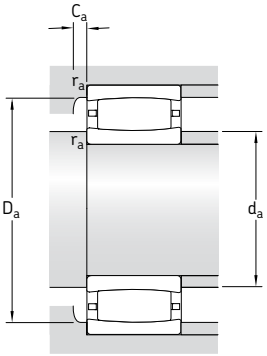
Tapered bore



Full complement

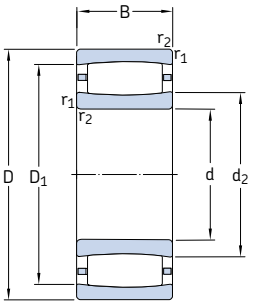
Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designations Bearing with cylindrical bore	tapered bore
d	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
60	85	25	112	170	19,6	–	3 000	0,46	* **C 4912 V**[1]	* **C 4912 K30V**[1]
	85	34	150	240	26,5	–	2 400	0,64	* **C 5912 V**[1]	–
	85	45	190	335	36	–	1 900	0,84	* **C 6912 V**	–
	110	28	143	156	18,3	5 600	7 500	1,10	* **C 2212 TN9**	* **C 2212 KTN9**
	110	28	166	190	22,4	–	2 800	1,15	* **C 2212 V**	* **C 2212 KV**
65	90	25	116	180	20,8	–	2 800	0,50	* **C 4913 V**[1]	* **C 4913 K30V**[1]
	90	34	156	260	30	–	2 200	0,70	* **C 5913 V**[1]	–
	90	45	196	355	38	–	1 800	0,93	* **C 6913 V**[1]	–
	100	35	196	275	32	–	2 400	1,00	* **C 4013 V**[1]	* **C 4013 K30V**[1]
	120	31	180	180	21,2	5 300	7 500	1,40	* **C 2213 TN9**	* **C 2213 KTN9**
	120	31	204	216	25,5	–	2 400	1,47	* **C 2213 V**	* **C 2213 KV**
70	100	30	163	240	28	–	2 600	0,78	* **C 4914 V**[1]	* **C 4914 K30V**[1]
	100	40	196	310	34,5	–	2 000	1,00	* **C 5914 V**[1]	–
	100	54	265	455	49	–	1 700	1,40	* **C 6914 V**[1]	–
	125	31	186	196	23,2	5 000	7 000	1,45	* **C 2214 TN9**	* **C 2214 KTN9**
	125	31	212	228	27	–	2 400	1,50	* **C 2214 V**	* **C 2214 KV**
	150	51	405	430	49	3 800	5 000	4,25	* **C 2314**	* **C 2314 K**
75	105	30	166	255	30	–	2 400	0,82	* **C 4915 V**[1]	* **C 4915 K30V**[1]
	105	40	204	325	37,5	–	1 900	1,10	* **C 5915 V**	–
	105	54	204	325	37,5	–	1 600	1,40	* **C 6915 V/VE240**	–
	115	40	208	345	40,5	–	2 000	1,60	* **C 4015 V**	* **C 4015 K30V**
	130	31	196	208	25,5	4 800	6 700	1,60	* **C 2215**	* **C 2215 K**
	130	31	220	240	29	–	2 200	1,65	* **C 2215 V**	* **C 2215 KV**
	160	55	425	465	52	3 600	4 800	5,20	* **C 2315**	* **C 2315 K**
80	110	30	173	275	31,5	–	2 200	0,87	* **C 4916 V**[1]	* **C 4916 K30V**[1]
	110	40	208	345	40	–	1 800	1,20	* **C 5916 V**[1]	–
	140	33	220	250	28,5	4 500	6 000	2,00	* **C 2216**	* **C 2216 K**
	140	33	255	305	34,5	–	2 000	2,10	* **C 2216 V**	* **C 2216 KV**
	170	58	510	550	61	3 400	4 500	6,20	* **C 2316**	* **C 2316 K**
85	120	35	224	355	40,5	–	2 000	1,30	* **C 4917 V**[1]	* **C 4917 K30V**[1]
	120	46	275	465	52	–	1 700	1,70	* **C 5917 V**[1]	–
	150	36	275	320	36,5	4 300	5 600	2,60	* **C 2217**	* **C 2217 K**
	150	36	315	390	44	–	1 800	2,80	* **C 2217 V**[1]	* **C 2217 KV**[1]
	180	60	540	600	65,5	3 200	4 300	7,30	* **C 2317**	* **C 2317 K**

* SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design

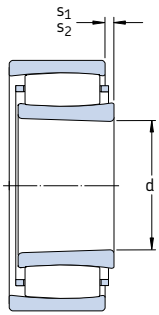


Dimensions						Abutment and fillet dimensions						Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_1[1] ~	s_2[1] ~	d_a min	d_a max	D_a min	D_a max	C_a[2] min	r_a max	k_1	k_2
mm						mm						–	
60	68	78,2	1	5,5	2,3	64,6	68	–	80,4	–	1	0,107	0,108
	66,8	76,5	1	6	2,8	64,6	66	–	80,4	–	1	0,097	0,11
	68,7	77,5	1	7,9	4,7	64,6	72	–	80,4	–	1	0,108	0,096
	77,1	97,9	1,5	8,5	–	69	77	95	101	0,3	1,5	0,1	0,123
	77,1	97,9	1,5	8,5	5,3	69	91	–	101	–	1,5	0,1	0,123
65	72,1	82,2	1	5,5	2,3	69,6	72	–	85,4	–	1	0,107	0,109
	72,9	82,6	1	6	2,8	69,6	72	–	85,4	–	1	0,097	0,111
	72,9	81,4	1	7,9	4,7	69,6	72	–	85,4	–	1	0,096	0,107
	74,2	89,1	1,1	6	2,8	71	74	–	94	–	1	0,1	0,108
	79	106	1,5	9,6	–	74	79	102	111	0,2	1,5	0,097	0,127
	79	106	1,5	9,6	5,3	74	97	–	111	–	1,5	0,097	0,127
70	78	91	1	6	2,8	74,6	78	–	95,4	–	1	0,107	0,107
	78,7	90,3	1	9,4	6,2	74,6	78	–	95,4	–	1	0,114	0,095
	79,1	89,8	1	9	5,8	74,6	79	–	95,4	–	1	0,102	0,1
	83,7	111	1,5	9,6	–	79	83	107	116	0,4	1,5	0,098	0,127
	83,7	111	1,5	9,6	5,3	79	102	–	116	–	1,5	0,098	0,127
	91,4	130	2,1	9,1	–	82	105	120	138	2,2	2	0,11	0,099
75	83,1	96,1	1	6	2,8	79,6	83	–	100	–	1	0,107	0,108
	83,6	95,5	1	9,4	6,2	79,6	89	–	100	–	1	0,098	0,114
	83,6	95,5	1	9,2	9,2	79,6	88	–	100	–	1	0,073	0,154
	88,7	101	1,1	9,4	5,1	81	94	90	109	–	1	0,099	0,114
	88,5	115	1,5	9,6	–	84	98	110	121	1,2	1,5	0,099	0,127
	88,5	115	1,5	9,6	5,3	84	105	–	121	–	1,5	0,099	0,127
	98,5	135	2,1	13,1	–	87	110	130	148	2,2	2	0,103	0,107
80	88,2	101	1	6	1,7	84,6	88	–	105	–	1	0,107	0,11
	88,8	101	1	9,4	5,1	84,6	88	–	105	–	1	0,114	0,098
	98,1	125	2	9,1	–	91	105	120	129	1,2	2	0,104	0,121
	98,1	125	2	9,1	4,8	91	115	–	129	–	2	0,104	0,121
	102	145	2,1	10,1	–	92	115	135	158	2,4	2	0,107	0,101
85	94,5	109	1,1	6	1,7	91	94	–	114	–	1	0,1	0,114
	95	109	1,1	8,9	4,6	91	95	–	114	–	1	0,098	0,109
	104	133	2	7,1	–	96	110	125	139	1,3	2	0,114	0,105
	104	133	2	7,1	1,7	96	115	–	139	–	2	0,114	0,105
	110	153	3	12,1	–	99	125	145	166	2,4	2,5	0,105	0,105

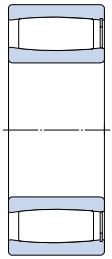
[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)



Cylindrical bore



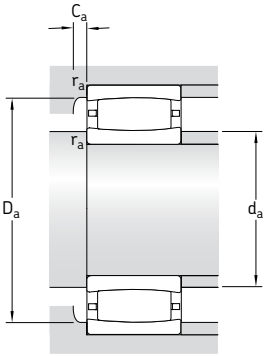
Tapered bore



Full complement

Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designations Bearing with cylindrical bore	tapered bore
d	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
90	125	35	186	315	35,5	–	2 000	1,30	* **C 4918 V**[1]	* **C 4918 K30V**[1]
	125	46	224	400	44	–	1 600	1,75	* **C 5918 V**	–
	150	72	455	670	73,5	–	1 500	5,10	* **BSC-2039 V**	–
	160	40	325	380	42,5	3 800	5 300	3,30	* **C 2218**	* **C 2218 K**
	160	40	365	440	49	–	1 500	3,40	* **C 2218 V**[1]	* **C 2218 KV**[1]
	190	64	610	695	73,5	2 800	4 000	8,50	* **C 2318**	* **C 2318 K**
95	170	43	360	400	44	3 800	5 000	4,00	* **C 2219**[1]	* **C 2219 K**[1]
	200	67	610	695	73,5	2 800	4 000	10,0	* **C 2319**	* **C 2319 K**
100	140	40	275	450	49	–	1 700	1,90	* **C 4920 V**[1]	* **C 4920 K30V**[1]
	140	54	375	640	68	–	1 400	2,70	* **C 5920 V**[1]	–
	150	50	355	530	57	–	1 400	3,05	* **C 4020 V**	* **C 4020 K30V**
	150	67	510	865	90	–	1 100	4,30	* **C 5020 V**	–
	165	52	475	655	71	–	1 300	4,40	* **C 3120 V**	–
	165	65	475	655	71	–	1 300	5,25	* **C 4120 V/VE240**	* **C 4120 K30V/VE240**
	170	65	475	655	71	–	1 400	5,95	* **BSC-2034 V**	–
	180	46	415	465	47,5	3 600	4 800	4,85	* **C 2220**	* **C 2220 K**
	215	73	800	880	91,5	2 600	3 600	12,5	* **C 2320**	* **C 2320 K**
110	170	45	355	480	51	3 200	4 500	3,50	* **C 3022**[1]	* **C 3022 K**[1]
	170	60	430	655	69,5	2 600	3 400	5,30	* **C 4022 MB**	* **C 4022 K30MB**
	170	60	500	800	85	–	1 200	5,20	* **C 4022 V**	* **C 4022 K30V**
	180	69	670	1 000	102	–	900	7,05	* **C 4122 V**	* **C 4122 K30V**
	200	53	530	620	64	3 200	4 300	6,90	* **C 2222**	* **C 2222 K**
120	180	46	375	530	55	3 000	4 000	3,90	* **C 3024**[1]	* **C 3024 K**[1]
	180	46	430	640	67	–	1 400	4,05	* **C 3024 V**	* **C 3024 KV**
	180	60	430	640	65,5	–	1 400	5,05	* **C 4024 V/VE240**	* **C 4024 K30V/VE240**
	180	60	530	880	90	–	1 100	5,50	* **C 4024 V**	* **C 4024 K30V**
	200	80	780	1 120	114	–	750	10,5	* **C 4124 V**[1]	* **C 4124 K30V**[1]
	215	58	610	710	72	3 000	4 000	8,60	* **C 2224**[1]	* **C 2224 K**[1]
	215	76	750	980	98	2 400	3 200	11,5	* **C 3224**	* **C 3224 K**
130	200	52	390	585	58,5	2 800	3 800	5,90	* **C 3026**[1]	* **C 3026 K**[1]
	200	69	620	930	91,5	1 900	2 800	7,84	* **C 4026**	* **C 4026 K30**
	200	69	720	1 120	112	–	850	8,05	* **C 4026 V**	* **C 4026 K30V**
	210	80	750	1 100	108	–	670	10,5	* **C 4126 V/VE240**	* **C 4126 K30V/VE240**
	230	64	735	930	93	2 800	3 800	11,0	* **C 2226**	* **C 2226 K**

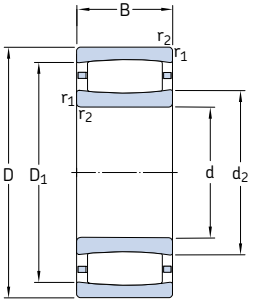
* SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



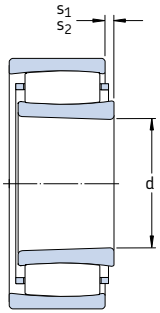
Dimensions						Abutment and fillet dimensions						Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_1[1] ~	s_2[1] ~	d_a min	d_a max	D_a min	D_a max	C_a[2] min	r_a max	k_1	k_2
mm						mm						–	
90	102	113	1,1	11	6,7	96	100	–	119	–	1	0,125	0,098
	102	113	1,1	15,4	11,1	96	105	–	119	–	1	0,089	0,131
	109	131	2	19,7	19,7	101	115	–	139	–	2	0,087	0,123
	112	144	2	9,5	–	101	120	130	149	1,4	2	0,104	0,117
	112	144	2	9,5	5,4	101	125	–	149	–	2	0,104	0,117
	119	166	3	9,6	–	104	135	155	176	2	2,5	0,108	0,101
95	113	149	2,1	10,5	–	107	112	149	158	4,2	2	0,114	0,104
	120	166	3	12,6	–	109	135	155	186	2,1	2,5	0,103	0,106
100	113	130	1,1	9,4	5,1	106	110	–	134	–	1	0,115	0,103
	110	127	1,1	9	4,7	106	105	–	134	–	1	0,103	0,105
	113	135	1,5	14	9,7	109	120	–	141	–	1,5	0,098	0,118
	114	136	1,5	9,3	5	109	125	–	141	–	1,5	0,112	0,094
	119	150	2	10	4,7	111	130	–	154	–	2	0,1	0,112
	120	148	2	17,7	17,7	111	130	–	154	–	2	0,09	0,125
	120	148	2	17,7	17,7	111	130	–	159	–	2	0,09	0,125
	118	157	2,1	10,1	–	112	130	150	168	0,9	2	0,108	0,11
	126	185	3	11,2	–	114	150	170	201	3,2	2,5	0,113	0,096
110	128	156	2	9,5	–	119	127	157	161	4	2	0,107	0,11
	126	150	2	4,8	–	120	125	146	160	1,3	2	–	0,103
	126	150	2	12	6,6	120	136	129	160	–	2	0,107	0,103
	132	163	2	11,4	4,6	120	145	–	170	–	2	0,111	0,097
	132	176	2,1	11,1	–	122	150	165	188	1,9	2	0,113	0,103
120	138	166	2	10,6	–	129	145	160	171	0,9	2	0,111	0,109
	138	166	2	10,6	3,8	129	150	–	171	–	2	0,111	0,109
	139	164	2	–	17,8	130	152	142	170	–	2	0,085	0,142
	140	164	2	12	5,2	129	150	–	171	–	2	0,109	0,103
	140	176	2	18	11,2	131	140	–	189	–	2	0,103	0,103
	144	191	2,1	13	–	132	143	192	203	5,4	2	0,113	0,103
	149	190	2,1	17,1	–	132	160	180	203	2,4	2	0,103	0,108
130	154	180	2	16,5	–	139	152	182	191	4,4	2	0,123	0,1
	149	181	2	11,4	–	139	155	175	191	1,9	2	0,113	0,097
	149	181	2	11,4	4,6	139	165	–	191	–	2	0,113	0,097
	153	190	2	9,7	9,7	141	170	–	199	–	2	0,09	0,126
	152	199	3	9,6	–	144	170	185	216	1,1	2,5	0,113	0,101

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

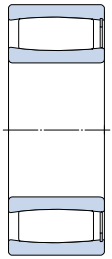
CARB toroidal roller bearings
d **140 – 190** mm



Cylindrical bore



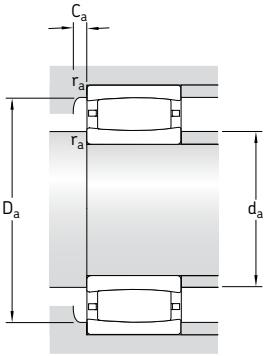
Tapered bore



Full complement

Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designations Bearing with cylindrical bore	tapered bore
d	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
140	210	53	490	735	72	2 600	3 400	6,30	✱ **C 3028**[1]	✱ **C 3028 K**[1]
	210	69	750	1 220	118	–	800	8,55	✱ **C 4028 V**	✱ **C 4028 K30V**
	225	85	1 000	1 600	153	–	630	14,2	✱ **C 4128 V**	✱ **C 4128 K30V**
	250	68	830	1 060	102	2 400	3 400	13,8	✱ **C 2228**	✱ **C 2228 K**
150	225	56	540	850	83	2 400	3 200	8,30	✱ **C 3030 MB**[1]	✱ **C 3030 KMB**[1]
	225	56	585	960	93	–	1 000	8,00	✱ **C 3030 V**	✱ **C 3030 KV**
	225	75	780	1 320	125	–	750	10,5	✱ **C 4030 V**	✱ **C 4030 K30V**
	250	80	880	1 290	122	2 000	2 800	15,0	✱ **C 3130**	✱ **C 3130 K**
	250	100	1 220	1 860	173	–	450	20,5	✱ **C 4130 V**[1]	✱ **C 4130 K30V**[1]
	270	73	980	1 220	116	2 400	3 200	17,5	✱ **C 2230**	✱ **C 2230 K**
160	240	60	600	980	93	2 200	3 000	9,60	✱ **C 3032**[1]	✱ **C 3032 K**[1]
	240	80	795	1 160	110	1 600	2 400	12,3	✱ **C 4032**	✱ **C 4032 K30**
	240	80	915	1 460	140	–	600	12,6	✱ **C 4032 V**	✱ **C 4032 K30V**
	270	86	1 000	1 400	129	1 900	2 600	21,5	✱ **C 3132 MB**	✱ **C 3132 KMB**
	270	109	1 460	2 160	200	–	300	26,0	✱ **C 4132 V**[1]	✱ **C 4132 K30V**[1]
	290	104	1 370	1 830	170	1 700	2 400	28,5	✱ **C 3232**	✱ **C 3232 K**
170	260	67	750	1 160	108	2 000	2 800	12,5	✱ **C 3034**[1]	✱ **C 3034 K**[1]
	260	90	1 140	1 860	170	–	500	17,5	✱ **C 4034 V**	✱ **C 4034 K30V**
	280	88	1 040	1 460	137	1 900	2 600	21,0	✱ **C 3134**[1]	✱ **C 3134 K**[1]
	280	109	1 530	2 280	208	–	280	27,0	✱ **C 4134 V**[1]	✱ **C 4134 K30V**[1]
	310	86	1 270	1 630	150	2 000	2 600	28,0	✱ **C 2234**	✱ **C 2234 K**
180	280	74	880	1 340	125	1 900	2 600	16,5	✱ **C 3036**	✱ **C 3036 K**[2]
	280	100	1 320	2 120	193	–	430	23,0	✱ **C 4036 V**	✱ **C 4036 K30V**
	300	96	1 250	1 730	156	1 800	2 400	26,0	✱ **C 3136**	✱ **C 3136 K**[2]
	300	118	1 760	2 700	240	–	220	34,5	✱ **C 4136 V**[1]	✱ **C 4136 K30V**[1]
	320	112	1 530	2 200	196	1 500	2 000	37,0	**C 3236**	✱ **C 3236 K**
190	290	75	930	1 460	132	1 800	2 400	17,5	✱ **C 3038**	✱ **C 3038 K**[2]
	290	100	1 370	2 320	204	–	380	24,5	✱ **C 4038 V**[1]	✱ **C 4038 K30V**[1]
	320	104	1 530	2 200	196	1 600	2 200	33,5	✱ **C 3138**[1]	✱ **C 3138 K**[1]
	320	128	2 040	3 150	275	–	130	43,0	✱ **C 4138 V**[1]	✱ **C 4138 K30V**[1]
	340	92	1 370	1 730	156	1 800	2 400	34,0	✱ **C 2238**	✱ **C 2238 K**[2]

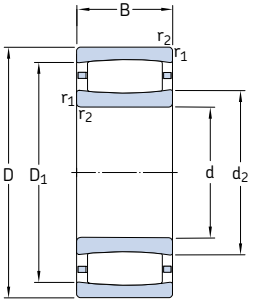
✱ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design
[2] Also available in design K/HA3C4



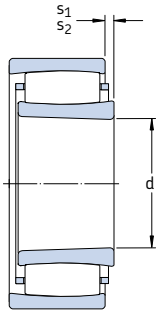
Dimensions						Abutment and fillet dimensions						Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_1[1] ~	s_2[1] ~	d_a min	d_a max	D_a min	D_a max	C_a[2] min	r_a max	k_1	k_2
mm						mm						–	
140	163	194	2	11	–	149	161	195	201	4,7	2	0,102	0,116
	161	193	2	11,4	5,9	149	175	–	201	–	2	0,115	0,097
	167	203	2,1	12	5,2	151	185	–	214	–	2	0,111	0,097
	173	223	3	13,7	–	154	190	210	236	2,3	2,5	0,109	0,108
150	173	204	2,1	8,7	–	161	172	200	214	1,3	2	–	0,108
	174	204	2,1	14,1	7,3	161	190	177	214	–	2	0,113	0,108
	173	204	2,1	17,4	10,6	161	185	–	214	–	2	0,107	0,106
	182	226	2,1	13,9	–	162	195	215	238	2,3	2	0,12	0,092
	179	222	2,1	20	10,1	162	175	–	228	–	2	0,103	0,103
	177	236	3	11,2	–	164	200	215	256	2,5	2,5	0,119	0,096
160	187	218	2,1	15	–	171	186	220	229	5,1	2	0,115	0,106
	181	217	2,1	18,1	–	171	190	210	229	2,2	2	0,109	0,103
	181	217	2,1	18,1	8,2	171	195	–	229	–	2	0,109	0,103
	190	240	2,1	10,3	–	172	189	229	258	3,8	2	–	0,099
	190	241	2,1	21	11,1	172	190	–	258	–	2	0,101	0,105
	194	256	3	19,3	–	174	215	245	276	2,6	2,5	0,112	0,096
170	200	237	2,1	12,5	–	181	200	238	249	5,8	2	0,105	0,112
	195	235	2,1	17,1	7,2	181	215	–	249	–	2	0,108	0,103
	200	249	2,1	21	–	182	200	250	268	7,6	2	0,101	0,109
	200	251	2,1	21	11,1	182	200	–	268	–	2	0,101	0,106
	209	274	4	16,4	–	187	230	255	293	3	3	0,114	0,1
180	209	251	2,1	15,1	–	191	220	240	269	2	2	0,112	0,105
	203	247	2,1	20,1	10,2	191	225	–	269	–	2	0,107	0,103
	210	266	3	23,2	–	194	230	255	286	2,2	2,5	0,102	0,111
	211	265	3	20	10,1	194	210	–	286	–	2,5	0,095	0,11
	228	289	4	27,3	–	197	245	275	303	3,2	3	0,107	0,104
190	225	266	2,1	16,1	–	201	235	255	279	1,9	2	0,113	0,107
	220	263	2,1	20	10,1	201	220	–	279	–	2	0,103	0,106
	228	289	3	19	–	204	227	290	306	9,1	2,5	0,096	0,113
	222	284	3	20	10,1	204	220	–	306	–	2,5	0,094	0,111
	224	296	4	22,5	–	207	250	275	323	1,6	3	0,108	0,108

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

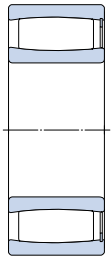
CARB toroidal roller bearings
d **200 – 380** mm



Cylindrical bore



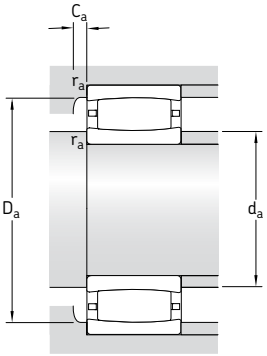
Tapered bore



Full complement

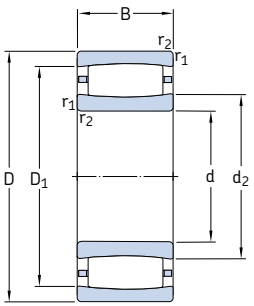
Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designations Bearing with cylindrical bore	tapered bore
d	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
200	310	82	1 120	1 730	153	1 700	2 400	22,0	✶ **C 3040**	✶ **C 3040 K**[2]
	310	109	1 630	2 650	232	–	260	30,5	✶ **C 4040 V**	✶ **C 4040 K30V**
	340	112	1 600	2 320	204	1 500	2 000	40,0	✶ **C 3140**	✶ **C 3140 K**[2]
	340	140	2 360	3 650	315	–	80	54,0	✶ **C 4140 V**[1]	✶ **C 4140 K30V**[1]
220	340	90	1 320	2 040	176	1 600	2 200	29,0	✶ **C 3044**	✶ **C 3044 K**[2]
	340	118	1 930	3 250	275	–	200	40,0	✶ **C 4044 V**[1]	✶ **C 4044 K30V**[1]
	370	120	1 900	2 900	245	1 400	1 900	51,0	✶ **C 3144**	✶ **C 3144 K**[2]
	400	108	2 000	2 500	216	1 500	2 000	56,5	✶ **C 2244**	✶ **C 2244 K**[2]
240	360	92	1 340	2 160	180	1 400	2 000	31,5	✶ **C 3048**	✶ **C 3048 K**[2]
	400	128	2 320	3 450	285	1 300	1 700	63,0	✶ **C 3148**	**C 3148 K**[2]
260	400	104	1 760	2 850	232	1 300	1 800	46,0	✶ **C 3052**	✶ **C 3052 K**[2]
	440	144	2 650	4 050	325	1 100	1 500	87,0	✶ **C 3152**	✶ **C 3152 K**[2]
280	420	106	1 860	3 100	250	1 200	1 600	50,0	✶ **C 3056**	✶ **C 3056 K**[2]
	460	146	2 850	4 500	355	1 100	1 400	93,0	✶ **C 3156**	✶ **C 3156 K**[2]
300	460	118	2 160	3 750	290	1 100	1 500	71,0	✶ **C 3060 M**	✶ **C 3060 KM**
	460	160	2 900	4 900	380	850	1 200	95,0	✶ **C 4060 M**[1]	✶ **C 4060 K30M**[1]
	500	160	3 250	5 200	400	1 000	1 300	120	✶ **C 3160**	✶ **C 3160 K**[2]
	500	200	4 150	6 700	520	750	1 000	165	✶ **C 4160 MB**	✶ **C 4160 K30MB**
320	480	121	2 280	4 000	310	1 000	1 400	76,5	✶ **C 3064 M**	✶ **C 3064 KM**
	540	176	4 150	6 300	480	950	1 300	160	✶ **C 3164 M**	✶ **C 3164 KM**
340	520	133	2 900	5 000	375	950	1 300	100	✶ **C 3068 M**[1]	✶ **C 3068 KM**[1]
	580	190	4 900	7 500	560	850	1 200	205	✶ **C 3168 M**	✶ **C 3168 KM**[2]
360	480	90	1 760	3 250	250	1 000	1 400	44,0	✶ **C 3972 M**	✶ **C 3972 KM**
	540	134	2 900	5 000	375	900	1 200	105	✶ **C 3072 M**[1]	✶ **C 3072 KM**[1)2)]
	600	192	5 000	8 000	585	800	1 100	215	✶ **C 3172 M**	✶ **C 3172 KM**[2]
380	520	106	2 120	4 000	300	950	1 300	66	✶ **C 3976 M**[1]	✶ **C 3976 KM**[1]
	560	135	3 000	5 200	390	900	1 200	110	✶ **C 3076 M**[1]	✶ **C 3076 KM**[1]
	620	194	4 400	7 200	520	750	1 000	243	✶ **C 3176 MB**	✶ **C 3176 KMB**

✶ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design
[2] Also available in design K/HA3C4 or KM/HA3C4 respectively

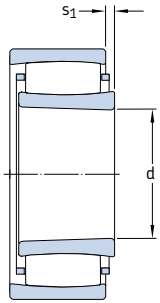


Dimensions						Abutment and fillet dimensions						Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_1[1] ~	s_2[1] ~	d_a min	d_a max	D_a min	D_a max	C_a[2] min	r_a max	k_1	k_2
mm						mm						–	
200	235	285	2,1	15,2	–	211	250	275	299	2,9	2	0,123	0,095
	229	280	2,1	21	11,1	211	225	–	299	–	2	0,11	0,101
	245	305	3	27,3	–	214	260	307	326	–	2,5	0,108	0,104
	237	302	3	22	12,1	214	235	–	326	–	2,5	0,092	0,112
220	257	310	3	17,2	–	233	270	295	327	3,1	2,5	0,114	0,104
	251	306	3	20	10,1	233	250	–	327	–	2,5	0,095	0,113
	268	333	4	22,3	–	237	290	315	353	3,5	3	0,114	0,097
	259	350	4	20,5	–	237	295	320	383	1,7	3	0,113	0,101
240	276	329	3	19,2	–	253	290	315	347	1,3	2,5	0,113	0,106
	281	357	4	20,4	–	257	305	335	383	3,7	3	0,116	0,095
260	305	367	4	19,3	–	275	325	350	385	3,4	3	0,122	0,096
	314	394	4	26,4	–	277	340	375	423	4,1	3	0,115	0,096
280	328	389	4	21,3	–	295	350	375	405	1,8	3	0,121	0,098
	336	416	5	28,4	–	300	360	395	440	4,1	4	0,115	0,097
300	352	417	4	20	–	315	375	405	445	1,7	3	0,123	0,095
	338	409	4	30,4	–	315	360	400	445	2,8	3	0,105	0,106
	362	448	5	30,5	–	320	390	425	480	4,9	4	0,106	0,106
	354	448	5	14,9	–	320	353	424	480	3,4	4	–	0,097
320	376	440	4	23,3	–	335	395	430	465	1,8	3	0,121	0,098
	372	476	5	26,7	–	340	410	455	520	3,9	4	0,114	0,096
340	402	482	5	25,4	–	358	430	465	502	1,9	4	0,12	0,099
	405	517	5	25,9	–	360	445	490	560	4,2	4	0,118	0,093
360	394	450	3	17,2	–	373	405	440	467	1,6	2,5	0,127	0,104
	417	497	5	26,4	–	378	445	480	522	2	4	0,12	0,099
	423	537	5	27,9	–	380	460	510	522	3,9	4	0,117	0,094
380	428	489	4	21	–	395	450	475	505	1,8	3	0,129	0,098
	431	511	5	27	–	398	460	495	542	2	4	0,12	0,1
	446	551	5	25,4	–	400	445	526	600	7,3	4	–	0,106

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)



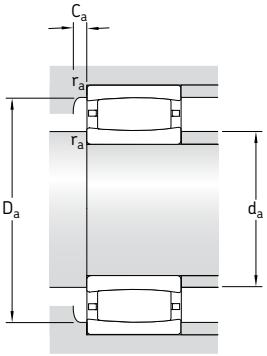
Cylindrical bore



Tapered bore

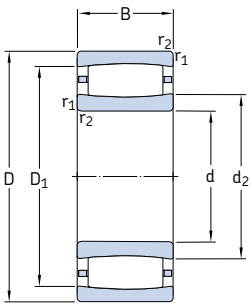
Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designations Bearing with cylindrical bore	tapered bore
d	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
400	540	106	2 120	4 000	290	900	1 300	68,5	✱ **C 3980 M**[1]	✱ **C 3980 KM**[1]
	600	148	3 650	6 200	450	800	1 100	140	✱ **C 3080 M**[1]	✱ **C 3080 KM**[1]
	650	200	4 800	8 300	585	700	950	260	✱ **C 3180 M**	✱ **C 3180 KM**
420	560	106	2 160	4 250	310	850	1 200	71,0	✱ **C 3984 M**	✱ **C 3984 KM**
	620	150	3 800	6 400	465	800	1 100	150	✱ **C 3084 M**	✱ **C 3084 KM**
	700	224	6 000	10 400	710	670	900	340	✱ **C 3184 M**	✱ **C 3184 KM**[2]
440	600	118	2 600	5 300	375	800	1 100	99	✱ **C 3988 M**[1]	✱ **C 3988 KM**[1]
	650	157	3 750	6 400	465	750	1 000	185	✱ **C 3088 MB**	✱ **C 3088 KMB**
	720	226	6 700	11 400	780	630	850	385	✱ **C 3188 MB**	✱ **C 3188 KMB**
	720	280	7 500	12 900	900	500	670	471	✱ **C 4188 MB**	✱ **C 4188 K30MB**
460	620	118	2 700	5 300	375	800	1 100	100	✱ **C 3992 MB**[1]	✱ **C 3992 KMB**[1]
	680	163	4 000	7 500	510	700	950	200	✱ **C 3092 M**	✱ **C 3092 KM**[2]
	760	240	6 800	12 000	800	600	800	430	✱ **C 3192 M**	✱ **C 3192 KM**
	760	300	8 300	14 300	950	480	630	535	✱ **C 4192 M**	✱ **C 4192 K30M**
480	650	128	3 100	6 100	430	750	1 000	120	✱ **C 3996 M**	✱ **C 3996 KM**
	700	165	4 050	7 800	530	670	900	210	✱ **C 3096 M**	✱ **C 3096 KM**
	790	248	6 950	12 500	830	560	750	490	✱ **C 3196 MB**[1]	✱ **C 3196 KMB**[1]
500	670	128	3 150	6 300	440	700	950	125	✱ **C 39/500 M**	✱ **C 39/500 KM**
	720	167	4 250	8 300	560	630	900	225	✱ **C 30/500 M**	✱ **C 30/500 KM**[2]
	830	264	7 500	12 700	850	530	750	550	✱ **C 31/500 M**	✱ **C 31/500 KM**[2]
	830	325	10 200	18 600	1 220	430	560	730	✱ **C 41/500 MB**	✱ **C 41/500 K30MB**
530	710	136	3 550	7 100	490	670	900	150	**C 39/530 M**	**C 39/530 KM**
	780	185	5 100	9 500	640	600	800	295	**C 30/530 M**	**C 30/530 KM**[2]
	870	272	8 800	15 600	1 000	500	670	630	**C 31/530 M**	**C 31/530 KM**[2]
560	750	140	3 600	7 350	490	600	850	170	✱ **C 39/560 M**	✱ **C 39/560 KM**
	820	195	5 600	11 000	720	530	750	345	✱ **C 30/560 M**	✱ **C 30/560 KM**[2]
	920	280	9 500	17 000	1 100	480	670	750	✱ **C 31/560 MB**[1]	✱ **C 31/560 KMB**[1]
600	800	150	4 000	8 800	570	560	750	210	✱ **C 39/600 M**	✱ **C 39/600 KM**
	870	200	6 300	12 200	780	500	700	390	✱ **C 30/600 M**	✱ **C 30/600 KM**[2]
	980	300	10 200	18 000	1 140	430	600	929	✱ **C 31/600 MB**	✱ **C 31/600 KMB**
	980	375	12 900	23 200	1 460	340	450	1 150	✱ **C 41/600 MB**[1]	✱ **C 41/600 K30MB**[1]

✱ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design
[2] Also available in design KM/HA3C4

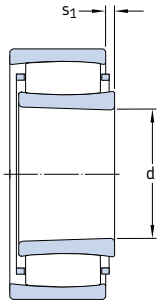


Dimensions					Abutment and fillet dimensions						Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_1[1] ~	d_a min	d_a max	D_a min	D_a max	C_a[2] min	r_a max	k_1	k_2
mm					mm						–	
400	439	501	4	21	415	461	487	525	1,8	3	0,13	0,098
	458	553	5	30,6	418	480	525	582	2,1	4	0,121	0,099
	488	589	6	50,7	426	526	564	624	2,5	5	0,106	0,109
420	462	522	4	21,3	435	480	515	545	1,8	3	0,132	0,098
	475	570	5	32,6	438	510	550	602	2,2	4	0,12	0,1
	508	618	6	34,8	446	540	595	674	3,8	5	0,113	0,098
440	494	560	4	20	455	517	546	585	1,9	3	0,133	0,095
	491	587	6	19,7	463	489	565	627	1,7	5	–	0,105
	522	647	6	16	466	521	613	694	7,5	5	–	0,099
	510	637	6	27,8	466	509	606	694	7,3	5	–	0,1
460	508	577	4	11	475	505	580	605	10,4	3	–	0,12
	539	624	6	33,5	486	565	605	654	2,3	5	0,114	0,108
	559	679	7,5	51	492	570	655	728	4,2	6	0,108	0,105
	540	670	7,5	46,2	492	570	655	728	5,6	6	0,111	0,097
480	529	604	5	20,4	498	550	590	632	2	4	0,133	0,095
	555	640	6	35,5	503	580	625	677	2,3	5	0,113	0,11
	583	700	7,5	24	512	580	705	758	20,6	6	–	0,104
500	556	631	5	20,4	518	580	615	652	2	4	0,135	0,095
	572	656	6	37,5	523	600	640	697	2,3	5	0,113	0,111
	605	738	7,5	75,3	532	655	705	798	–	6	0,099	0,116
	598	740	7,5	15	532	597	703	798	4,4	6	–	0,093
530	578	657	5	28,4	548	600	640	692	2,2	4	0,129	0,101
	601	704	6	35,7	553	635	685	757	2,5	5	0,12	0,101
	635	781	7,5	44,4	562	680	745	838	4,8	6	0,115	0,097
560	622	701	5	32,4	578	645	685	732	2,3	4	0,128	0,104
	660	761	6	45,7	583	695	740	793	2,7	5	0,116	0,106
	664	808	7,5	28	592	660	810	888	23,8	6	–	0,111
600	666	744	5	32,4	618	685	725	782	2,4	4	0,131	0,1
	692	805	6	35,9	623	725	775	847	2,7	5	0,125	0,098
	705	871	7,5	26,1	632	704	827	948	5,1	6	–	0,107
	697	869	7,5	24,6	632	696	823	948	5,5	6	–	0,097

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)



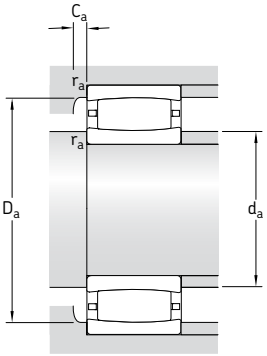
Cylindrical bore



Tapered bore

Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass	Designations Bearing with cylindrical bore	tapered bore
d	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
630	850	165	4 650	10 000	640	530	700	270	✶ **C 39/630 M**	✶ **C 39/630 KM**
	920	212	6 800	12 900	830	480	670	465	✶ **C 30/630 M**	✶ **C 30/630 KM**[2]
	1 030	315	11 800	20 800	1 290	400	560	1 089	✶ **C 31/630 MB**	✶ **C 31/630 KMB**
670	900	170	5 100	11 600	720	480	630	335	✶ **C 39/670 MB**	✶ **C 39/670 KMB**
	980	230	8 150	16 300	1 000	430	600	580	✶ **C 30/670 M**	✶ **C 30/670 KM**[2]
	1 090	336	12 000	22 000	1 320	380	530	1 230	✶ **C 31/670 MB**[1]	✶ **C 31/670 KMB**[1]
710	950	180	6 000	12 500	780	450	630	355	✶ **C 39/710 M**	✶ **C 39/710 KM**
	1 030	236	8 800	17 300	1 060	400	560	645	✶ **C 30/710 M**	✶ **C 30/710 KM**
	1 030	315	10 600	21 600	1 290	320	430	860	✶ **C 40/710 M**	✶ **C 40/710 K30M**
	1 150	345	12 700	24 000	1 430	360	480	1 410	✶ **C 31/710 MB**[1]	✶ **C 31/710 KMB**[1]
750	1 000	185	6 100	13 400	815	430	560	405	✶ **C 39/750 M**	✶ **C 39/750 KM**
	1 090	250	9 500	19 300	1 160	380	530	838	✶ **C 30/750 MB**	✶ **C 30/750 KMB**
	1 220	365	13 700	30 500	1 800	320	450	1 802	✶ **C 31/750 MB**	✶ **C 31/750 KMB**
800	1 060	195	5 850	15 300	915	380	530	504	✶ **C 39/800 MB**[1]	✶ **C 39/800 KMB**[1]
	1 150	258	9 150	18 600	1 120	360	480	860	✶ **C 30/800 MB**	✶ **C 30/800 KMB**
	1 280	375	15 600	30 500	1 760	300	400	1 870	✶ **C 31/800 MB**[1]	✶ **C 31/800 KMB**[1]
850	1 120	200	7 350	16 300	965	360	480	530	✶ **C 39/850 M**	✶ **C 39/850 KM**
	1 220	272	11 600	24 500	1 430	320	450	1 105	✶ **C 30/850 MB**	✶ **C 30/850 KMB**
	1 360	400	16 000	32 000	1 830	280	380	2 260	✶ **C 31/850 MB**[1]	✶ **C 31/850 KMB**[1]
900	1 180	206	8 150	18 000	1 060	340	450	580	✶ **C 39/900 MB**[1]	✶ **C 39/900 KMB**[1]
	1 280	280	12 700	26 500	1 530	300	400	1 200	✶ **C 30/900 MB**	✶ **C 30/900 KMB**
950	1 250	224	9 300	22 000	1 250	300	430	784	✶ **C 39/950 MB**[1]	✶ **C 39/950 KMB**[1]
	1 360	300	12 900	27 500	1 560	280	380	1 410	✶ **C 30/950 MB**[1]	✶ **C 30/950 KMB**[1]
1 000	1 420	308	13 400	29 000	1 630	260	340	1 570	✶ **C 30/1000 MB**[1]	✶ **C 30/1000 KMB**[1]
	1 580	462	22 800	45 500	2 500	220	300	3 470	✶ **C 31/1000 MB**[1]	✶ **C 31/1000 KMB**[1]
1 060	1 400	250	11 000	26 000	1 430	260	360	1 120	✶ **C 39/1060 MB**[1]	✶ **C 39/1060 KMB**[1]
1 180	1 540	272	13 400	33 500	1 800	220	300	1 400	✶ **C 39/1180 MB**	✶ **C 39/1180 KMB**
1 250	1 750	375	20 400	45 000	2 320	180	240	2 740	✶ **C 30/1250 MB**[1]	✶ **C 30/1250 KMB**[1]

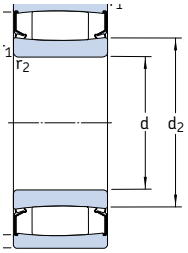
✶ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design
[2] Also available in design KM/HA3C4



Dimensions					Abutment and fillet dimensions						Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_1[1] ~	d_a min	d_a max	D_a min	D_a max	C_a[2] min	r_a max	k_1	k_2
mm					mm						–	
630	700	784	6	35,5	653	720	770	827	2,4	5	0,121	0,11
	717	840	7,5	48,1	658	755	810	892	2,9	6	0,118	0,104
	749	919	7,5	31	662	745	920	998	26,8	6	–	0,109
670	764	848	6	40,5	693	765	830	877	2,5	5	–	0,113
	775	904	7,5	41,1	698	820	875	952	2,9	6	0,121	0,101
	797	963	7,5	33	702	795	965	1 058	28	6	–	0,104
710	773	877	6	30,7	733	795	850	927	2,7	5	0,131	0,098
	807	945	7,5	47,3	738	850	910	1 002	3,2	6	0,119	0,104
	803	935	7,5	51,2	738	840	915	1 002	4,4	6	0,113	0,101
	848	1 012	9,5	34	750	845	1 015	1 100	28,6	8	–	0,102
750	830	933	6	35,7	773	855	910	977	2,7	5	0,131	0,101
	858	993	7,5	25	778	855	995	1 062	21,8	6	–	0,112
	888	1 076	9,5	36	790	885	1 080	1 180	31,5	8	–	0,117
800	889	990	6	45,7	823	915	970	1 037	2,9	5	–	0,106
	913	1 047	7,5	25	828	910	1 050	1 122	22,3	6	–	0,111
	947	1 133	9,5	37	840	945	1 135	1 240	32,1	8	–	0,115
850	940	1 053	6	35,9	873	960	1 025	1 097	2,9	5	0,135	0,098
	968	1 113	7,5	27	878	965	1 115	1 192	24,1	6	–	0,124
	1 020	1 200	12	40	898	1 015	1 205	1 312	33,5	10	–	0,11
900	989	1 113	6	20	923	985	1 115	1 157	18,4	5	–	0,132
	1 008	1 172	7,5	45,8	928	1 050	1 130	1 252	3,4	6	–	0,1
950	1 044	1 167	7,5	35	978	1 080	1 145	1 222	3,1	6	–	0,098
	1 080	1 240	7,5	30	978	1 075	1 245	1 322	26,2	6	–	0,116
1 000	1 136	1 294	7,5	30	1 028	1 135	1 295	1 392	26,7	6	–	0,114
	1 179	1 401	12	46	1 048	1 175	1 405	1 532	38,6	10	–	0,105
1 060	1 175	1 323	7,5	25	1 088	1 170	1 325	1 372	23,4	6	–	0,142
1 180	1 311	1 457	7,5	44,4	1 208	1 335	1 425	1 512	4,1	6	–	0,097
1 250	1 397	1 613	9,5	37	1 284	1 395	1 615	1 716	33,9	8	–	0,126

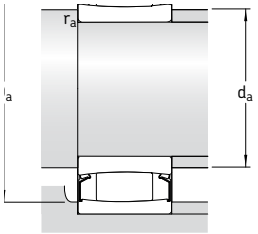
[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

Sealed CARB toroidal roller bearings
d **50 – 180** mm



Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Limiting speed	Mass	Designation
d	D	B	C	C_0	P_u			
mm			kN		kN	r/min	kg	–
50	72	40	140	224	24,5	200	0,56	✱ **C 6910-2CS5V**[1]
60	85	45	150	240	26,5	170	0,83	✱ **C 6912-2CS5V**[1]
65	100	35	102	173	19	150	1,10	✱ **C 4013-2CS5V**
75	105	54	204	325	37,5	140	1,40	✱ **C 6915-2CS5V**
	115	40	143	193	23,2	130	1,40	✱ **C 4015-2CS5V**[1]
90	125	46	224	400	44	110	1,75	✱ **C 5918-2CS5V**
100	150	50	310	450	50	95	2,90	✱ **C 4020-2CS5V**[1]
	165	65	475	655	71	90	5,20	✱ **C 4120-2CS5V**[1]
110	170	60	415	585	63	85	4,60	✱ **C 4022-2CS5V**[1]
	180	69	500	710	75	85	6,60	✱ **C 4122-2CS5V**
120	180	60	430	640	67	80	5,10	✱ **C 4024-2CS5V**
	200	80	710	1 000	100	75	9,70	✱ **C 4124-2CS5V**[1]
130	200	69	550	830	85	70	7,50	✱ **C 4026-2CS5V**
	210	80	750	1 100	108	70	10,5	✱ **C 4126-2CS5V**
140	210	69	570	900	88	67	7,90	✱ **C 4028-2CS5V**[1]
	225	85	780	1 200	116	63	12,5	✱ **C 4128-2CS5V**
150	225	75	585	965	93	63	10,0	✱ **C 4030-2CS5V**
	250	100	1 220	1 860	173	60	20,5	✱ **C 4130-2CS5V**[1]
160	240	80	655	1 100	104	60	12,0	✱ **C 4032-2CS5V**[1]
	270	109	1 460	2 160	200	53	26,0	✱ **C 4132-2CS5V**[1]
170	260	90	965	1 630	150	53	17,0	✱ **C 4034-2CS5V**[1]
	280	109	1 530	2 280	208	53	27,0	✱ **C 4134-2CS5V**[1]
180	280	100	1 320	2 120	193	53	23,5	✱ **C 4036-2CS5V**[1]
	300	118	1 760	2 700	240	48	35,0	✱ **C 4136-2CS5V**[1]

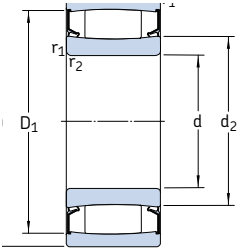
✱ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



Dimensions					Abutment and fillet dimensions				Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_2[1] ~	d_a min	d_a max	D_a max	r_a max	k_1	k_2
mm					mm				–	
50	57,6	64,9	0,6	2,8	53,2	57	68,8	0,6	0,113	0,091
60	68	75,3	1	5,4	64,6	67	80,4	1	0,128	0,083
65	78,6	87,5	1,1	5,9	71	78	94	1	0,071	0,181
75	83,6	95,5	1	7,1	79,6	83	100	1	0,073	0,154
	88,5	104	1,1	7,3	81	88	111	1	0,210	0,063
90	102	113	1,1	4,5	96	101	119	1	0,089	0,131
100	114	136	1,5	6,2	107	113	143	1,5	0,145	0,083
	120	148	2	7,3	111	120	154	2	0,09	0,125
110	128	155	2	7,9	119	127	161	2	0,142	0,083
	130	160	2	8,2	121	129	169	2	0,086	0,133
120	140	164	2	7,5	129	139	171	2	0,085	0,142
	140	176	2	8,2	131	139	189	2	0,126	0,087
130	152	182	2	8,2	139	151	191	2	0,089	0,133
	153	190	2	7,5	141	152	199	2	0,09	0,126
140	163	193	2	8,7	149	162	201	2	0,133	0,089
	167	204	2,1	8,9	152	166	213	2	0,086	0,134
150	175	204	2,1	10,8	161	174	214	2	0,084	0,144
	179	221	2,1	6,4	162	178	238	2	0,103	0,103
160	188	218	2,1	11,4	170	187	230	2	0,154	0,079
	190	241	2,1	6,7	172	189	258	2	0,101	0,105
170	201	237	2,1	9	180	199	250	2	0,116	0,097
	200	251	2,1	6,7	182	198	268	2	0,101	0,106
180	204	246	2,1	6,4	190	202	270	2	0,103	0,105
	211	265	3	6,4	194	209	286	2,5	0,095	0,11

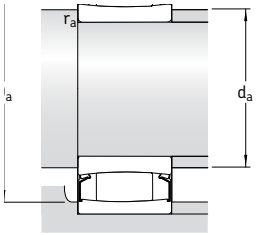
[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)

Sealed CARB toroidal roller bearings
d **190 – 200** mm



Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Limiting speed	Mass	Designation
d	D	B	C	C_0	P_u			
mm			kN		kN	r/min	kg	–
190	290	100	1 370	2 320	204	48	24,5	* **C 4038-2CS5V**[1)]
	320	128	2 040	3 150	275	45	43,5	* **C 4138-2CS5V**[1)]
200	310	109	1 630	2 650	232	45	31,0	* **C 4040-2CS5V**[1)]
	340	140	2 360	3 650	315	43	54,5	* **C 4140-2CS5V**[1)]

* SKF Explorer bearing
1) Please check availability of the bearing before incorporating it in a bearing arrangement design

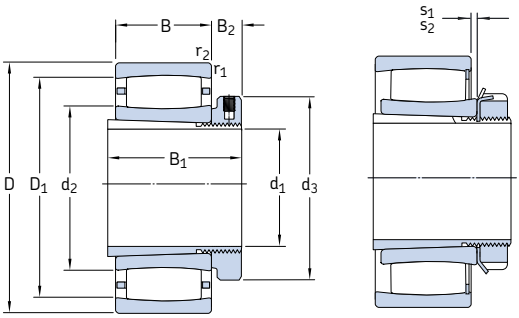


Dimensions					Abutment and fillet dimensions				Calculation factors	
d	d_2 ~	D_1 ~	$r_{1,2}$ min	s_2[1] ~	d_a min	d_a max	D_a max	r_a max	k_1	k_2
mm					mm				–	
190	221	263	2,1	6,4	200	219	280	2	0,103	0,106
	222	283	3	6,4	204	220	306	2,5	0,094	0,111
200	229	280	2,1	6,7	210	227	300	2	0,101	0,108
	237	301	3	7	214	235	326	2,5	0,092	0,112

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)

CARB toroidal roller bearings on adapter sleeve

d_1 **20 – 70** mm



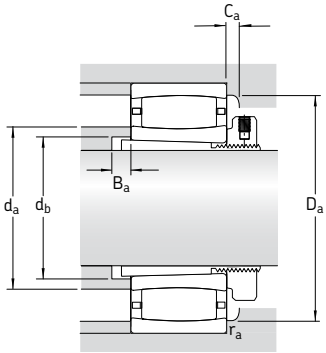
Bearing on E-design adapter sleeve

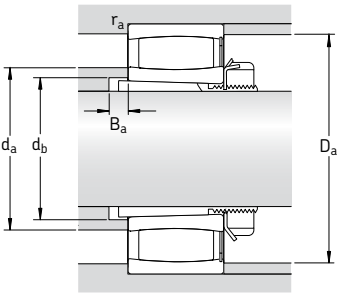
Full complement bearing on standard adapter sleeve

Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass	Designations	
			dynamic	static		Reference speed	Limiting speed	Bearing + sleeve	Bearing	Adapter sleeve
d_1	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
20	52	18	44	40	4,55	13 000	18 000	0,24	∗ **C 2205 KTN9**[1]	**H 305 E**
	52	18	50	48	5,5	–	7 000	0,25	∗ **C 2205 KV**[1]	**H 305 E**
25	62	20	69,5	62	7,2	11 000	15 000	0,37	∗ **C 2206 KTN9**	**H 306 E**
	62	20	76,5	71	8,3	–	6 000	0,39	∗ **C 2206 KV**	**H 306 E**
30	72	23	83	80	9,3	9 500	13 000	0,59	∗ **C 2207 KTN9**	**H 307 E**
	72	23	95	96,5	11,2	–	5 000	0,59	∗ **C 2207 KV**	**H 307 E**
35	80	23	90	86,5	10,2	8 000	11 000	0,69	∗ **C 2208 KTN9**	**H 308 E**
	80	23	102	104	12	–	4 500	0,70	∗ **C 2208 KV**	**H 308**
40	85	23	93	93	10,8	8 000	11 000	0,76	∗ **C 2209 KTN9**	**H 309 E**
	85	23	106	110	12,9	–	4 300	0,79	∗ **C 2209 KV**	**H 309 E**
45	90	23	98	100	11,8	7 000	9 500	0,85	∗ **C 2210 KTN9**	**H 310 E**
	90	23	114	122	14,3	–	3 800	0,89	∗ **C 2210 KV**	**H 310 E**
50	100	25	116	114	13,4	6 700	9 000	1,10	∗ **C 2211 KTN9**	**H 311 E**
	100	25	132	134	16	–	3 400	1,15	∗ **C 2211 KV**	**H 311 E**
55	110	28	143	156	18,3	5 600	7 500	1,45	∗ **C 2212 KTN9**	**H 312 E**
	110	28	166	190	22,4	–	2 800	1,50	∗ **C 2212 KV**	**H 312**
60	120	31	180	180	21,2	5 300	7 500	1,80	∗ **C 2213 KTN9**	**H 313 E**
	120	31	204	216	25,5	–	2 400	1,90	∗ **C 2213 KV**	**H 313**
	125	31	186	196	23,2	5 000	7 000	2,10	∗ **C 2214 KTN9**	**H 314 E**
	125	31	212	228	27	–	2 400	2,20	∗ **C 2214 KV**	**H 314**
	150	51	405	430	49	3 800	5 000	5,10	∗ **C 2314 K**	**H 2314**
65	130	31	196	208	25,5	4 800	6 700	2,30	∗ **C 2215 K**	**H 315 E**
	130	31	220	240	29	–	2 200	2,40	∗ **C 2215 KV**	**H 315**
	160	55	425	465	52	3 600	4 800	6,20	∗ **C 2315 K**	**H 2315**
70	140	33	220	250	28,5	4 500	6 000	2,90	∗ **C 2216 K**	**H 316 E**
	140	33	255	305	34,5	–	2 000	3,00	∗ **C 2216 KV**	**H 316**
	170	58	510	550	61	3 400	4 500	7,40	∗ **C 2316 K**	**H 2316**

∗ SKF Explorer bearing

[1] Please check availability of the bearing before incorporating it in a bearing arrangement design

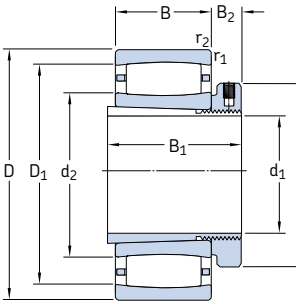




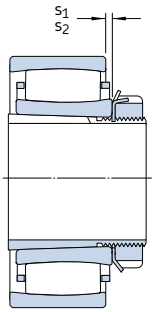
Dimensions									Abutment and fillet dimensions							Calculation factors	
d_1	d_2 ~	d_3	D_1 ~	B_1	B_2	$r_{1,2}$ min	s_1[1] ~	s_2[1] ~	d_a max	d_b min	D_a min	D_a max	B_a min	C_a[2] min	r_a max	k_1	k_2
mm									mm							–	
20	32,1	38	43,3	29	10,5	1	5,8	–	32	28	42	46,4	5	0,3	1	0,09	0,126
	32,1	38	43,3	29	10,5	1	5,8	2,8	39	28	–	46,4	5	–	1	0,09	0,126
25	37,4	45	53,1	31	10,5	1	4,5	–	37	33	51	56,4	5	0,3	1	0,101	0,111
	37,4	45	53,1	31	10,5	1	4,5	1,5	49	33	–	56,4	5	–	1	0,101	0,111
30	44,8	52	60,7	35	11,5	1,1	5,7	–	44	39	59	65	5	0,1	1	0,094	0,121
	44,8	52	60,7	35	11,5	1,1	5,7	2,7	57	39	–	65	5	–	1	0,094	0,121
35	52,4	58	69,9	36	13	1,1	7,1	–	52	44	68	73	5	0,3	1	0,093	0,128
	52,4	58	69,9	36	10	1,1	7,1	4,1	66	44	–	73	5	–	1	0,093	0,128
40	55,6	65	73,1	39	13	1,1	7,1	–	55	50	71	78	7	0,3	1	0,095	0,128
	55,6	65	73,1	39	13	1,1	7,1	4,1	69	50	–	78	7	–	1	0,095	0,128
45	61,9	70	79,4	42	14	1,1	7,1	–	61	55	77	83	9	0,8	1	0,097	0,128
	61,9	70	79,4	42	14	1,1	7,1	3,9	73	55	–	83	9	–	1	0,097	0,128
50	65,8	75	86,7	45	14	1,5	8,6	–	65	60	84	91	10	0,3	1,5	0,094	0,133
	65,8	75	86,7	45	14	1,5	8,6	5,4	80	60	–	91	10	–	1,5	0,094	0,133
55	77,1	80	97,9	47	14	1,5	8,5	–	77	65	95	101	9	0,3	1,5	0,1	0,123
	77,1	80	97,9	47	12,5	1,5	8,5	5,3	91	65	–	101	9	–	1,5	0,1	0,123
60	79	85	106	50	15	1,5	9,6	–	79	70	102	111	8	0,2	1,5	0,097	0,127
	79	85	106	50	13,5	1,5	9,6	5,3	97	70	–	111	8	–	1,5	0,097	0,127
	83,7	92	111	52	15	1,5	9,6	–	83	75	107	116	9	0,4	1,5	0,098	0,127
	83,7	92	111	52	13,5	1,5	9,6	5,3	102	75	–	116	9	–	1,5	0,098	0,127
	91,4	92	130	68	13,5	2,1	9,1	–	105	76	120	138	6	2,2	2	0,11	0,099
65	88,5	98	115	55	16	1,5	9,6	–	98	80	110	121	12	1,2	1,5	0,099	0,127
	88,5	98	115	55	14,5	1,5	9,6	5,3	105	80	–	121	12	–	1,5	0,099	0,127
	98,5	98	135	73	14,5	2,1	13,1	–	110	82	130	148	5	2,2	2	0,103	0,107
70	98,1	105	125	59	18	2	9,1	–	105	85	120	129	12	1,2	2	0,104	0,121
	98,1	105	125	59	17	2	9,1	4,8	115	85	–	129	12	–	2	0,104	0,121
	102	105	145	78	17	2,1	10,1	–	115	88	135	158	6	2,4	2	0,107	0,101

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

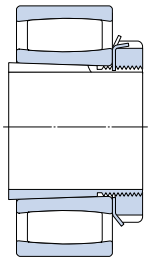
CARB toroidal roller bearings on adapter sleeve
d_1 **75 – 140** mm



Bearing on E-design adapter sleeve



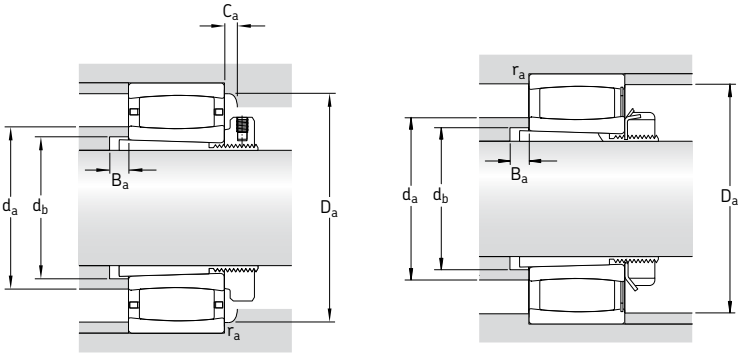
Bearing on L-design or standard adapter sleeve



Full complement bearing on standard adapter sleeve

Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass	Designations	
			dynamic	static		Reference speed	Limiting speed	Bearing + sleeve	Bearing	Adapter sleeve
d_1	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
75	150	36	275	320	36,5	4 300	5 600	3,70	✱ **C 2217 K**	**H 317 E**
	150	36	315	390	44	–	1 800	3,85	✱ **C 2217 KV**[1]	**H 317**
	180	60	540	600	65,5	3 200	4 300	8,50	✱ **C 2317 K**	**H 2317**
80	160	40	325	380	42,5	3 800	5 300	4,50	✱ **C 2218 K**	**H 318 E**
	160	40	365	440	49	–	1 500	4,60	✱ **C 2218 KV**[1]	**H 318**
	190	64	610	695	73,5	2 800	4 000	10,0	✱ **C 2318 K**	**H 2318**
85	170	43	360	400	44	3 800	5 000	5,30	✱ **C 2219 K**[1]	**H 319 E**
	200	67	610	695	73,5	2 800	4 000	11,5	✱ **C 2319 K**	**H 2319**
90	165	52	475	655	71	–	1 300	6,10	✱ **C 3120 KV**	**H 3120 E**
	180	46	415	465	47,5	3 600	4 800	6,30	✱ **C 2220 K**	**H 320 E**
	215	73	800	880	91,5	2 600	3 600	14,5	✱ **C 2320 K**	**H 2320**
100	170	45	355	480	51	3 200	4 500	5,50	✱ **C 3022 K**	**H 322 E**
	200	53	530	620	64	3 200	4 300	8,80	✱ **C 2222 K**	**H 322 E**
110	180	46	375	530	55	3 000	4 000	5,70	✱ **C 3024 K**[1]	**H 3024 E**
	180	46	430	640	67	–	1 400	5,85	✱ **C 3024 KV**	**H 3024**
	215	58	610	710	72	3 000	4 000	8,60	✱ **C 2224 K**[1]	**H 3124 L**
	215	76	750	980	98	2 400	3 200	14,2	✱ **C 3224 K**	**H 2324 L**
115	200	52	390	585	58,5	2 800	3 800	8,70	✱ **C 3026 K**[1]	**H 3026**
	230	64	735	930	93	2 800	3 800	14,0	✱ **C 2226 K**	**H 3126 L**
125	210	53	490	735	72	2 600	3 400	9,30	✱ **C 3028 K**[1]	**H 3028**
	250	68	830	1 060	102	2 400	3 400	17,5	✱ **C 2228 K**	**H 3128 L**
135	225	56	585	960	93	–	1 000	11,5	✱ **C 3030 KV**	**H 3030**
	225	56	540	850	83	2 400	3 200	12,0	✱ **C 3030 KMB**[1]	**H 3030 E**
	250	80	880	1 290	122	2 000	2 800	20,0	✱ **C 3130 K**	**H 3130 L**
	270	73	980	1 220	116	2 400	3 200	23,0	✱ **C 2230 K**	**H 3130 L**
140	240	60	600	980	93	2 200	3 000	14,5	✱ **C 3032 K**[1]	**H 3032**
	270	86	1 000	1 400	129	1 900	2 600	28,0	✱ **C 3132 KMB**	**H 3132 E**
	290	104	1 370	1 830	170	1 700	2 400	36,5	✱ **C 3232 K**	**H 2332 L**

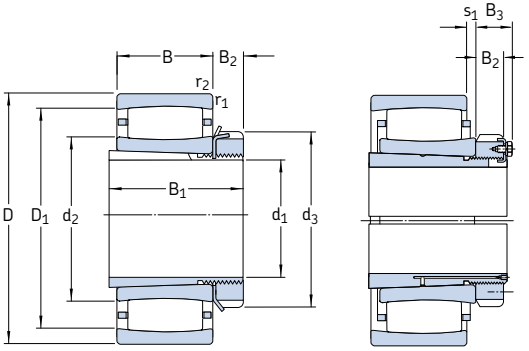
✱ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



Dimensions									Abutment and fillet dimensions							Calculation factors	
d_1	d_2 ~	d_3	D_1 ~	B_1	B_2	$r_{1,2}$ min	s_1[1] ~	s_2[1] ~	d_a max	d_b min	D_a min	D_a max	B_a min	C_a[2] min	r_a max	k_1	k_2
mm									mm							–	
75	104	110	133	63	19	2	7,1	–	110	91	125	139	12	1,3	2	0,114	0,105
	104	110	133	63	18	2	7,1	1,7	115	91	–	139	12	–	2	0,114	0,105
	110	110	153	82	18	3	12,1	–	125	94	145	166	7	2,4	2,5	0,105	0,105
80	112	120	144	65	19	2	9,5	–	120	96	130	149	10	1,4	2	0,104	0,117
	112	120	144	65	18	2	9,5	5,4	125	96	–	149	10	–	2	0,104	0,117
	119	120	166	86	18	3	9,6	–	135	100	155	176	7	2	2,5	0,108	0,101
85	113	125	149	68	20	2,1	10,5	–	112	102	149	158	9	4,2	2	0,114	0,104
	120	125	166	90	19	3	12,6	–	135	105	155	186	7	2,1	2,5	0,103	0,106
90	119	130	150	76	20	2	10	4,7	130	106	–	154	6	–	2	0,1	0,112
	118	130	157	71	21	2,1	10,1	–	130	108	150	168	8	0,9	2	0,108	0,11
	126	130	185	97	20	3	11,2	–	150	110	170	201	7	3,2	2,5	0,113	0,096
100	128	145	156	77	21,5	2	9,5	–	127	118	157	160	14	4	2	0,107	0,11
	132	145	176	77	21,5	2,1	11,1	–	150	118	165	188	6	1,9	2	0,113	0,103
110	138	155	166	72	26	2	10,6	–	145	127	160	170	7	0,9	2	0,111	0,109
	138	145	166	72	22	2	10,6	3,8	150	127	–	170	7	–	2	0,111	0,109
	144	145	191	88	22	2,1	13	–	143	128	192	203	11	5,4	2	0,113	0,103
	149	145	190	112	22	2,1	17,1	–	160	131	180	203	17	2,4	2	0,103	0,108
115	154	155	180	80	23	2	16,5	–	152	137	182	190	8	4,4	2	0,123	0,1
	152	155	199	92	23	3	9,6	–	170	138	185	216	8	1,1	2,5	0,113	0,101
125	163	165	194	82	24	2	11	–	161	147	195	200	8	4,7	2	0,102	0,116
	173	165	223	97	24	3	13,7	–	190	149	210	236	8	2,3	2,5	0,109	0,108
135	174	195	204	87	30	2,1	14,1	7,3	190	158	177	214	8	–	2	0,113	0,108
	173	180	204	87	26	2,1	8,7	–	172	158	200	214	8	1,3	2	–	0,108
	182	180	226	111	26	2,1	13,9	–	195	160	215	238	8	2,3	2	0,12	0,092
	177	180	236	111	26	3	11,2	–	200	160	215	256	15	2,5	2,5	0,119	0,096
140	187	190	218	93	27,5	2,1	15	–	186	168	220	229	8	5,1	2	0,115	0,106
	190	190	240	119	27,5	2,1	10,3	–	189	170	229	258	8	3,8	2	–	0,099
	194	190	256	147	27,5	3	19,3	–	215	174	245	276	18	2,6	2,5	0,112	0,096

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

CARB toroidal roller bearings on adapter sleeve
d_1 **150 – 320** mm

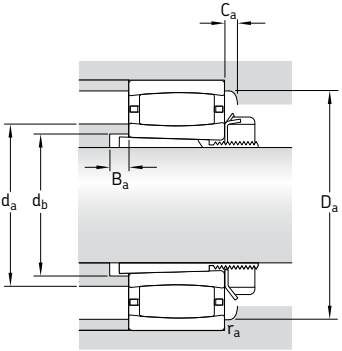


Bearing on L-design or standard adapter sleeve

Bearing on OH .. H(TL)-design adapter sleeve

Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass	Designations	
			dynamic	static		Reference speed	Limiting speed	Bearing + sleeve	Bearing	Adapter sleeve
d_1	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
150	260	67	750	1 160	108	2 000	2 800	18,0	∗ **C 3034 K**[1]	**H 3034**
	280	88	1 040	1 460	137	1 900	2 600	29,0	∗ **C 3134 K**[1]	**H 3134 L**
	310	86	1 270	1 630	150	2 000	2 600	35,0	∗ **C 2234 K**	**H 3134 L**
160	280	74	880	1 340	125	1 900	2 600	23,0	∗ **C 3036 K**	**H 3036**
	300	96	1 250	1 730	156	1 800	2 400	34,0	∗ **C 3136 K**	**H 3136 L**
	320	112	1 530	2 200	196	1 500	2 000	47,0	∗ **C 3236 K**	**H 2336**
170	290	75	930	1 460	132	1 800	2 400	24,0	∗ **C 3038 K**	**H 3038**
	320	104	1 530	2 200	196	1 600	2 200	44,0	∗ **C 3138 K**[1]	**H 3138 L**
	340	92	1 370	1 730	156	1 800	2 400	43,0	∗ **C 2238 K**	**H 3138**
180	310	82	1 120	1 730	153	1 700	2 400	30,0	∗ **C 3040 K**	**H 3040**
	340	112	1 600	2 320	204	1 500	2 000	50,5	∗ **C 3140 K**	**H 3140**
200	340	90	1 320	2 040	176	1 600	2 200	37,0	∗ **C 3044 K**	**OH 3044 H**
	370	120	1 900	2 900	245	1 400	1 900	64,0	∗ **C 3144 K**	**OH 3144 HTL**
	400	108	2 000	2 500	216	1 500	2 000	69,0	∗ **C 2244 K**	**OH 3144 H**
220	360	92	1 340	2 160	180	1 400	2 000	42,5	∗ **C 3048 K**	**OH 3048 H**
	400	128	2 320	3 450	285	1 300	1 700	77,0	∗ **C 3148 K**	**OH 3148 HTL**
240	400	104	1 760	2 850	232	1 300	1 800	59,0	∗ **C 3052 K**	**OH 3052 H**
	440	144	2 650	4 050	325	1 100	1 500	105	∗ **C 3152 K**	**OH 3152 HTL**
260	420	106	1 860	3 100	250	1 200	1 600	65,0	∗ **C 3056 K**	**OH 3056 H**
	460	146	2 850	4 500	355	1 100	1 400	115	∗ **C 3156 K**	**OH 3156 HTL**
280	460	118	2 160	3 750	290	1 100	1 500	91,0	∗ **C 3060 KM**	**OH 3060 H**
	500	160	3 250	5 200	400	1 000	1 300	150	∗ **C 3160 K**	**OH 3160 H**
300	480	121	2 280	4 000	310	1 000	1 400	95,0	∗ **C 3064 KM**	**OH 3064 H**
	540	176	4 150	6 300	480	950	1 300	190	∗ **C 3164 KM**	**OH 3164 H**
320	520	133	2 900	5 000	375	950	1 300	125	∗ **C 3068 KM**[1]	**OH 3068 H**
	580	190	4 900	7 500	560	850	1 200	235	∗ **C 3168 KM**	**OH 3168 H**

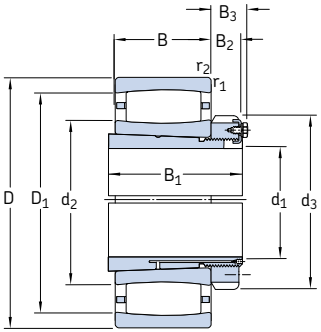
∗ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



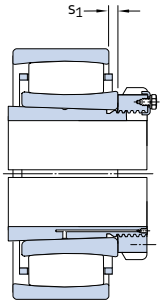
Dimensions									Abutment and fillet dimensions							Calculation factors	
d_1	d_2 ~	d_3	D_1 ~	B_1	B_2	B_3	$r_{1,2}$ min	s_1 [1] ~	d_a max	d_b min	D_a min	D_a max	B_a min	C_a [2] min	r_a max	k_1	k_2
mm									mm							–	
150	200	200	237	101	28,5	2,1	12,5	–	200	179	238	249	8	5,8	2	0,105	0,112
	200	200	249	122	28,5	2,1	21	–	200	180	250	268	8	7,6	2	0,101	0,109
	209	200	274	122	28,5	4	16,4	–	230	180	255	293	10	3	3	0,114	0,1
160	209	210	251	109	29,5	2,1	15,1	–	220	189	240	269	8	2	2	0,112	0,105
	210	240	266	131	29,5	3	23,2	–	230	191	255	286	8	2,2	2,5	0,102	0,111
	228	230	289	161	30	4	27,3	–	245	195	275	303	22	3,2	3	0,107	0,104
170	225	220	266	112	30,5	2,1	16,1	–	235	199	255	279	9	1,9	2	0,113	0,107
	228	220	289	141	30,5	3	19	–	227	202	290	306	9	9,1	2,5	0,096	0,113
	224	240	296	141	31	4	22,5	–	250	202	275	323	21	1,6	3	0,108	0,108
180	235	240	285	120	31,5	2,1	15,2	–	250	210	275	299	9	2,9	2	0,123	0,095
	245	250	305	150	32	3	27,3	–	260	212	307	326	9	–	2,5	0,108	0,104
200	257	260	310	126	30	41	3	17,2	270	231	295	327	9	3,1	2,5	0,114	0,104
	268	260	333	161	30	41	4	22,3	290	233	315	353	9	3,5	3	0,114	0,097
	259	280	350	161	35	–	4	20,5	295	233	320	383	21	1,7	3	0,113	0,101
220	276	290	329	133	34	46	3	19,2	290	251	315	347	11	1,3	2,5	0,113	0,106
	281	290	357	172	34	46	4	20,4	305	254	335	383	11	3,7	3	0,116	0,095
240	305	310	367	145	34	46	4	19,3	325	272	350	385	11	3,4	3	0,122	0,096
	314	310	394	190	34	46	4	26,4	340	276	375	423	11	4,1	3	0,115	0,096
260	328	330	389	152	38	50	4	21,3	350	292	375	405	12	1,8	3	0,121	0,098
	336	330	416	195	38	50	5	28,4	360	296	395	440	12	4,1	4	0,115	0,097
280	352	360	417	168	42	54	4	20	375	313	405	445	12	1,7	3	0,123	0,095
	362	380	448	208	40	53	5	30,5	390	318	425	480	12	4,9	4	0,106	0,106
300	376	380	440	171	42	55	4	23,3	395	334	430	465	13	1,8	3	0,121	0,098
	372	400	476	226	42	56	5	26,7	410	338	455	520	13	3,9	4	0,114	0,096
320	402	400	482	187	45	58	5	25,4	430	355	465	502	14	1,9	4	0,12	0,099
	405	440	517	254	55	72	5	25,9	445	360	490	560	14	4,2	4	0,118	0,093

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

CARB toroidal roller bearings on adapter sleeve
d_1 **340 – 530** mm



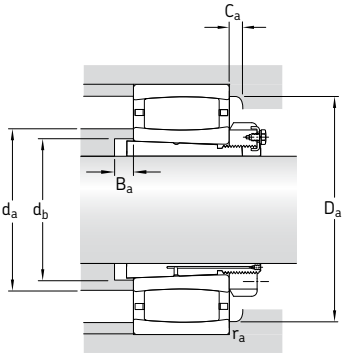
Bearing on OH .. H-design adapter sleeve



Bearing on OH .. HE-design adapter sleeve

Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass	Designations	
			dynamic	static		Reference	Limiting	Bearing +	Bearing	Adapter
d_1	D	B	C	C_0	P_u	speed	speed	sleeve		sleeve
mm			kN		kN	r/min		kg	–	
340	480	90	1 760	3 250	250	1 000	1 400	73,0	✱ **C 3972 KM**	**OH 3972 HE**
	540	134	2 900	5 000	375	900	1 200	135	✱ **C 3072 KM**[1]	**OH 3072 H**
	600	192	5 000	8 000	585	800	1 100	250	✱ **C 3172 KM**	**OH 3172 H**
360	520	106	2 120	4 000	300	950	1 300	95	✱ **C 3976 KM**[1]	**OH 3976 H**
	560	135	3 000	5 200	390	900	1 200	145	✱ **C 3076 KM**[1]	**OH 3076 H**
	620	194	4 400	7 200	520	750	1 000	298	✱ **C 3176 KMB**	**OH 3176 HE**
380	540	106	2 120	4 000	290	900	1 300	102	✱ **C 3980 KM**[1]	**OH 3980 HE**
	600	148	3 650	6 200	450	800	1 100	175	✱ **C 3080 KM**[1]	**OH 3080 H**
	650	200	4 800	8 300	585	700	950	325	✱ **C 3180 KM**	**OH 3180 H**
400	560	106	2 160	4 250	310	850	1 200	105	✱ **C 3984 KM**	**OH 3984 HE**
	620	150	3 800	6 400	465	800	1 100	180	✱ **C 3084 KM**	**OH 3084 H**
	700	224	6 000	10 400	710	670	900	395	✱ **C 3184 KM**	**OH 3184 H**
410	600	118	2 600	5 300	375	800	1 100	155	✱ **C 3988 KM**[1]	**OH 3988 HE**
	650	157	3 750	6 400	465	750	1 000	250	✱ **C 3088 KMB**	**OH 3088 HE**
	720	226	6 700	11 400	780	630	850	470	✱ **C 3188 KMB**	**OH 3188 HE**
430	620	118	2 700	5 300	375	800	1 100	160	✱ **C 3992 KMB**[1]	**OH 3992 HE**
	680	163	4 000	7 500	510	700	950	270	✱ **C 3092 KM**	**OH 3092 H**
	760	240	6 800	12 000	800	600	800	540	✱ **C 3192 KM**	**OH 3192 H**
450	650	128	3 100	6 100	430	750	1 000	185	✱ **C 3996 KM**	**OH 3996 H**
	700	165	4 050	7 800	530	670	900	275	✱ **C 3096 KM**	**OH 3096 H**
	790	248	6 950	12 500	830	560	750	620	✱ **C 3196 KMB**[1]	**OH 3196 HE**
470	670	128	3 150	6 300	440	700	950	195	✱ **C 39/500 KM**	**OH 39/500 HE**
	720	167	4 250	8 300	560	630	900	305	✱ **C 30/500 KM**	**OH 30/500 H**
	830	264	7 500	12 700	850	530	750	690	✱ **C 31/500 KM**	**OH 31/500 H**
500	710	136	3 550	7 100	490	670	900	230	✱ **C 39/530 KM**	**OH 39/530 HE**
	780	185	5 100	9 500	640	600	800	390	✱ **C 30/530 KM**	**OH 30/530 H**
	870	272	8 800	15 600	1 000	500	670	770	✱ **C 31/530 KM**	**OH 31/530 H**
530	750	140	3 600	7 350	490	600	850	260	✱ **C 39/560 KM**	**OH 39/560 HE**
	820	195	5 600	11 000	720	530	750	440	✱ **C 30/560 KM**	**OH 30/560 H**
	920	280	9 500	17 000	1 100	480	670	930	✱ **C 31/560 KMB**[1]	**OH 31/560 HE**

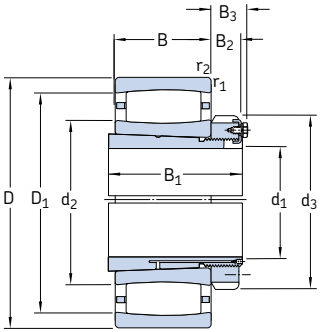
✱ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



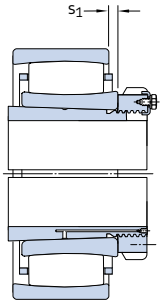
Dimensions									Abutment and fillet dimensions							Calculation factors	
d_1	d_2 ~	d_3	D_1 ~	B_1	B_2	B_3	$r_{1,2}$ min	s_1 [1] ~	d_a max	d_b min	D_a min	D_a max	B_a min	C_a [2] min	r_a max	k_1	k_2
mm									mm							–	
340	394	420	450	144	45	58	3	17,2	405	372	440	467	14	1,6	2,5	0,127	0,104
	417	420	497	188	45	58	5	26,4	445	375	480	522	14	2	4	0,12	0,099
	423	460	537	259	58	75	5	27,9	460	380	510	580	14	3,9	4	0,117	0,094
360	428	450	489	164	48	62	4	21	450	393	475	505	15	1,8	3	0,129	0,098
	431	450	511	193	48	62	5	27	460	396	495	542	15	2	4	0,12	0,1
	446	490	551	264	60	77	5	25,4	445	401	526	600	15	7,3	4	–	0,106
380	439	470	501	168	52	66	4	21	461	413	487	525	15	1,8	3	0,13	0,098
	458	470	553	210	52	66	5	30,6	480	417	525	582	15	2,1	4	0,121	0,099
	488	520	589	272	62	82	6	50,7	526	421	564	624	15	2,5	5	0,106	0,109
400	462	490	522	168	52	66	4	21,3	480	433	515	545	15	1,8	3	0,132	0,098
	475	490	570	212	52	66	5	32,6	510	437	550	602	16	2,2	4	0,12	0,1
	508	540	618	304	70	90	6	34,8	540	443	595	674	16	3,8	5	0,113	0,098
410	494	520	560	189	60	77	4	20	517	454	546	585	17	1,9	3	0,133	0,095
	491	520	587	228	60	77	6	19,7	489	458	565	627	17	1,7	5	–	0,105
	522	560	647	307	70	90	6	16	521	463	613	694	17	7,5	5	–	0,099
430	508	540	577	189	60	77	4	11	505	474	580	605	17	10,4	3	–	0,12
	539	540	624	234	60	77	6	33,5	565	478	605	657	17	2,3	5	0,114	0,108
	559	580	679	326	75	95	7,5	51	570	484	655	728	17	4,2	6	0,108	0,105
450	529	560	604	200	60	77	5	20,4	550	496	590	632	18	2	4	0,133	0,095
	555	560	640	237	60	77	6	35,5	580	499	625	677	18	2,3	5	0,113	0,11
	583	620	700	335	75	95	7,5	24	580	505	705	758	18	20,6	6	–	0,104
470	556	580	631	208	68	85	5	20,4	580	516	615	652	18	2	4	0,135	0,095
	572	580	656	247	68	85	6	37,5	600	519	640	697	18	2,3	5	0,113	0,111
	605	630	738	356	80	100	7,5	75,3	655	527	705	798	18	–	6	0,099	0,116
500	578	630	657	216	68	90	5	28,4	600	547	640	692	20	2,2	4	0,129	0,101
	601	630	704	265	68	90	6	35,7	635	551	685	757	20	2,5	5	0,12	0,101
	635	670	781	364	80	105	7,5	44,4	680	558	745	838	20	4,8	6	0,115	0,097
530	622	650	701	227	75	97	5	32,4	645	577	685	732	20	2,3	4	0,128	0,104
	660	650	761	282	75	97	6	45,7	695	582	740	797	20	2,7	5	0,116	0,106
	664	710	808	377	85	110	7,5	28	660	589	810	888	20	23,8	6	–	0,111

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

CARB toroidal roller bearings on adapter sleeve
d_1 **560 – 1 000** mm



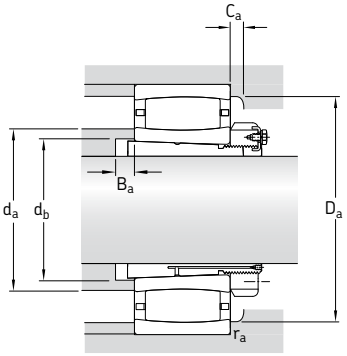
Bearing on OH .. H-design adapter sleeve



Bearing on OH .. HE-design adapter sleeve

Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass	Designations	
			dynamic	static		Reference speed	Limiting speed	Bearing + sleeve	Bearing	Adapter sleeve
d_1	D	B	C	C_0	P_u				–	
mm			kN		kN	r/min		kg	–	
560	800	150	4 000	8 800	570	560	750	325	★ **C 39/600 KM**	**OH 39/600 HE**
	870	200	6 300	12 200	780	500	700	520	★ **C 30/600 KM**	**OH 30/600 H**
	980	300	10 200	18 000	1 140	430	600	1 135	★ **C 31/600 KMB**	**OH 31/600 HE**
600	850	165	4 650	10 000	640	530	700	420	★ **C 39/630 KM**	**OH 39/630 HE**
	920	212	6 800	12 900	830	480	670	635	★ **C 30/630 KM**	**OH 30/630 H**
	1 030	315	11 800	20 800	1 290	400	560	1 310	★ **C 31/630 KMB**	**OH 31/630 HE**
630	900	170	5 100	11 600	720	480	630	490	★ **C 39/670 KMB**	**OH 39/670 HE**
	980	230	8 150	16 300	1 000	430	600	750	★ **C 30/670 KM**	**OH 30/670 H**
	1 090	336	12 000	22 000	1 320	380	530	1 550	★ **C 31/670 KMB**[1)]	**OH 31/670 HE**
670	950	180	6 000	12 500	780	450	630	520	★ **C 39/710 KM**	**OH 39/710 HE**
	1 030	236	8 800	17 300	1 060	400	560	865	★ **C 30/710 KM**	**OH 30/710 H**
	1 150	345	12 700	24 000	1 430	360	480	1 800	★ **C 31/710 KMB**[1)]	**OH 31/710 HE**
710	1 000	185	6 100	13 400	815	430	560	590	★ **C 39/750 KM**	**OH 39/750 HE**
	1 090	250	9 500	19 300	1 160	380	530	1 060	★ **C 30/750 KMB**	**OH 30/750 HE**
	1 220	365	13 700	30 500	1 800	320	450	2 200	★ **C 31/750 KMB**	**OH 31/750 HE**
750	1 060	195	5 850	15 300	915	380	530	750	★ **C 39/800 KMB**[1)]	**OH 39/800 HE**
	1 150	258	9 150	18 600	1 120	360	480	1 150	★ **C 30/800 KMB**	**OH 30/800 HE**
	1 280	375	15 600	30 500	1 760	300	400	2 400	★ **C 31/800 KMB**[1)]	**OH 31/800 HE**
800	1 120	200	7 350	16 300	965	360	480	785	★ **C 39/850 KM**	**OH 39/850 HE**
	1 220	272	11 600	24 500	1 430	320	450	1 415	★ **C 30/850 KMB**	**OH 30/850 HE**
	1 360	400	16 000	32 000	1 830	280	380	2 260	★ **C 31/850 KMB**[1)]	**OH 31/850 HE**
850	1 180	206	8 150	18 000	1 060	340	450	900	★ **C 39/900 KMB**[1)]	**OH 39/900 HE**
	1 280	280	12 700	26 500	1 530	300	400	1 540	★ **C 30/900 KMB**	**OH 30/900 HE**
900	1 250	224	9 300	22 000	1 250	300	430	1 120	★ **C 39/950 KMB**[1)]	**OH 39/950 HE**
	1 360	300	12 900	27 500	1 560	280	380	1 800	★ **C 30/950 KMB**[1)]	**OH 30/950 HE**
950	1 420	308	13 400	29 000	1 630	260	340	2 000	★ **C 30/1000 KMB**[1)]	**OH 30/1000 HE**
	1 580	462	22 800	45 500	2 500	220	300	4 300	★ **C 31/1000 KMB**[1)]	**OH 31/1000 HE**
1 000	1 400	250	11 000	26 000	1 430	260	360	1 610	★ **C 39/1060 KMB**[1)]	**OH 39/1060 HE**

★ SKF Explorer bearing
[1)] Please check availability of the bearing before incorporating it in a bearing arrangement design

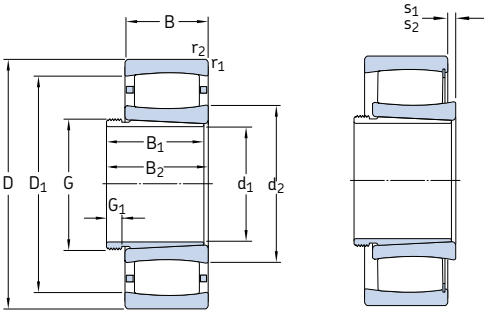


Dimensions									Abutment and fillet dimensions							Calculation factors	
d_1	d_2 ~	d_3	D_1 ~	B_1	B_2	B_3	$r_{1,2}$ min	s_1 [1] ~	d_a max	d_b min	D_a min	D_a max	B_a min	C_a [2] min	r_a max	k_1	k_2
mm									mm							–	
560	666	700	744	239	75	97	5	32,4	685	619	725	782	22	2,4	4	0,131	0,1
	692	700	805	289	75	97	6	35,9	725	623	775	847	22	2,7	5	0,125	0,098
	705	750	871	399	85	110	7,5	26,1	704	632	827	948	22	5,1	6	–	0,107
600	700	730	784	254	75	97	6	35,5	720	650	770	827	22	2,4	5	0,121	0,11
	717	730	840	301	75	97	7,5	48,1	755	654	810	892	22	2,9	6	0,118	0,104
	741	800	916	424	95	120	7,5	23,8	740	663	868	998	22	5,7	6	–	0,102
630	761	780	848	264	80	102	6	24,9	760	691	833	877	22	4,2	5	–	0,113
	775	780	904	324	80	102	7,5	41,1	820	696	875	952	22	2,9	6	0,121	0,101
	797	850	963	456	106	131	7,5	33	795	705	965	1 058	22	28	6	–	0,104
670	773	830	877	286	90	112	6	30,7	795	732	850	927	26	2,7	5	0,131	0,098
	807	830	945	342	90	112	7,5	47,3	850	736	910	1 002	26	3,2	6	0,119	0,104
	848	900	1 012	467	106	135	9,5	34	845	745	1 015	1 110	26	28,6	8	–	0,102
710	830	870	933	291	90	112	6	35,7	855	772	910	977	26	2,7	5	0,131	0,101
	854	870	993	356	90	112	7,5	28,6	852	778	961	1 062	26	7,4	6	–	0,11
	884	950	1 077	493	112	141	9,5	33	883	787	1 025	1 180	26	9,3	8	–	0,094
750	885	920	990	303	90	112	6	28,1	883	825	971	1 037	28	5,3	5	–	0,106
	913	920	1 047	366	90	112	7,5	25	910	829	1 050	1 122	28	22,3	6	–	0,111
	947	1 000	1 133	505	112	141	9,5	37	945	838	1 135	1 240	28	32,1	8	–	0,115
800	940	980	1 053	308	90	115	6	35,9	960	876	1 025	1 097	28	2,9	5	0,135	0,098
	964	980	1 113	380	90	115	7,5	24	963	880	1 077	1 192	28	7,7	6	–	0,097
	1 020	1 060	1 200	536	118	147	12	40	1 015	890	1 205	1 312	28	33,5	10	–	0,11
850	989	1 030	1 113	326	100	125	6	20	985	924	1 115	1 157	30	18,4	5	–	0,132
	1 004	1 030	1 173	400	100	125	7,5	25,5	1 002	931	1 124	1 252	30	3,3	6	–	0,1
900	1 042	1 080	1 167	344	100	125	7,5	14,5	1 040	976	1 139	1 222	30	6,6	6	–	0,098
	1 080	1 080	1 240	420	100	125	7,5	30	1 075	983	1 245	1 332	30	26,2	6	–	0,116
950	1 136	1 140	1 294	430	100	125	7,5	30	1 135	1 034	1 295	1 392	33	26,7	6	–	0,114
	1 179	1 240	1 401	609	125	154	12	46	1 175	1 047	1 405	1 532	33	38,6	10	–	0,105
1 000	1 175	1 200	1 323	372	100	125	7,5	25	1 170	1 090	1 325	1 392	33	23,4	6	–	0,11

[1] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[2] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

CARB toroidal roller bearings on withdrawal sleeve

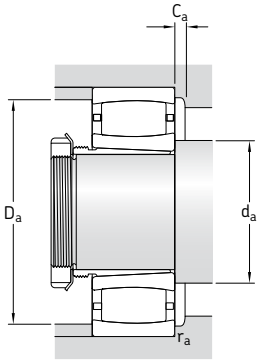
d_1 **35 – 85** mm



Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass	Designations	
			dynamic	static		Reference speed	Limiting speed	Bearing + sleeve	Bearing	Withdrawal sleeve
d_1	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
35	80	23	90	86,5	10,2	8 000	11 000	0,59	★ **C 2208 KTN9**	**AH 308**
	80	23	102	104	12	–	4 500	0,62	★ **C 2208 KV**	**AH 308**
40	85	23	93	93	10,8	8 000	11 000	0,67	★ **C 2209 KTN9**	**AH 309**
	85	23	106	110	12,9	–	4 300	0,70	★ **C 2209 KV**	**AH 309**
45	90	23	98	100	11,8	7 000	9 500	0,72	★ **C 2210 KTN9**	**AHX 310**
	90	23	114	122	14,3	–	3 800	0,75	★ **C 2210 KV**	**AHX 310**
50	100	25	116	114	13,4	6 700	9 000	0,95	★ **C 2211 KTN9**	**AHX 311**
	100	25	132	134	16	–	3 400	0,97	★ **C 2211 KV**	**AHX 311**
55	110	28	143	156	18,3	5 600	7 500	1,30	★ **C 2212 KTN9**	**AHX 312**
	110	28	166	190	22,4	–	2 800	1,35	★ **C 2212 KV**	**AHX 312**
60	120	31	180	180	21,2	5 300	7 500	1,60	★ **C 2213 KTN9**	**AH 313 G**
	120	31	204	216	25,5	–	2 400	1,70	★ **C 2213 KV**	**AH 313 G**
65	125	31	186	196	23,2	5 000	7 000	1,70	★ **C 2214 KTN9**	**AH 314 G**
	125	31	212	228	27	–	2 400	1,75	★ **C 2214 KV**	**AH 314 G**
	150	51	405	430	49	3 800	5 000	4,65	★ **C 2314 K**	**AHX 2314 G**
70	130	31	196	208	25,5	4 800	6 700	1,90	★ **C 2215 K**	**AH 315 G**
	130	31	220	240	29	–	2 200	1,95	★ **C 2215 KV**	**AH 315 G**
	160	55	425	465	52	3 600	4 800	5,65	★ **C 2315 K**	**AHX 2315 G**
75	140	33	220	250	28,5	4 500	6 000	2,35	★ **C 2216 K**	**AH 316**
	140	33	255	305	34,5	–	2 000	2,45	★ **C 2216 KV**	**AH 316**
	170	58	510	550	61	3 400	4 500	6,75	★ **C 2316 K**	**AHX 2316**
80	150	36	275	320	36,5	4 300	5 600	3,00	★ **C 2217 K**	**AHX 317**
	150	36	315	390	44	–	1 800	3,20	★ **C 2217 KV**[1)]	**AHX 317**
	180	60	540	600	65,5	3 200	4 300	7,90	★ **C 2317 K**	**AHX 2317**
85	160	40	325	380	42,5	3 800	5 300	3,75	★ **C 2218 K**	**AHX 318**
	160	40	365	440	49	–	1 500	3,85	★ **C 2218 KV**[1)]	**AHX 318**
	190	64	610	695	73,5	2 800	4 000	9,00	★ **C 2318 K**	**AHX 2318**

★ SKF Explorer bearing

[1)] Please check availability of the bearing before incorporating it in a bearing arrangement design

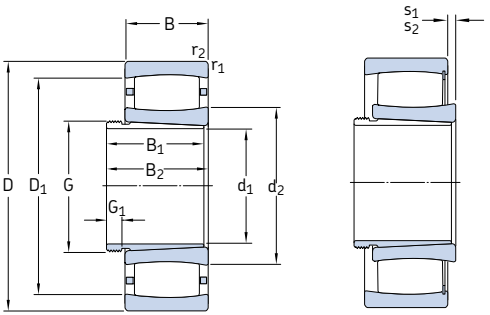


Dimensions										Abutment and fillet dimensions						Calculation factors	
d_1	d_2 ~	D_1 ~	B_1	B_2[1] ~	G	G_1	$r_{1,2}$ min	s_1[2] ~	s_2[2] ~	d_a min	d_a max	D_a min	D_a max	C_a[3] min	r_a max	k_1	k_2
mm										mm						–	
35	52,4	69,9	29	32	M 45×1,5	6	1,1	7,1	–	47	52	68	73	0,3	1	0,093	0,128
	52,4	69,9	29	32	M 45×1,5	6	1,1	7,1	4,1	47	66	–	73	–	1	0,093	0,128
40	55,6	73,1	31	34	M 50×1,5	6	1,1	7,1	–	52	55	71	78	0,3	1	0,095	0,128
	55,6	73,1	31	34	M 50×1,5	6	1,1	7,1	4,1	52	69	–	78	–	1	0,095	0,128
45	61,9	79,4	35	38	M 55×2	7	1,1	7,1	–	57	61	77	83	0,8	1	0,097	0,128
	61,9	79,4	35	38	M 55×2	7	1,1	7,1	3,9	57	73	–	83	–	1	0,097	0,128
50	65,8	86,7	37	40	M 60×2	7	1,5	8,6	–	64	65	84	91	0,3	1,5	0,094	0,133
	65,8	86,7	37	40	M 60×2	7	1,5	8,6	5,4	64	80	–	91	–	1,5	0,094	0,133
55	77,1	97,9	40	43	M 65×2	8	1,5	8,5	–	69	77	95	101	0,3	1,5	0,1	0,123
	77,1	97,9	40	43	M 65×2	8	1,5	8,5	5,3	69	91	–	101	–	1,5	0,1	0,123
60	79	106	42	45	M 70×2	8	1,5	9,6	–	74	79	102	111	0,2	1,5	0,097	0,127
	79	106	42	45	M 70×2	8	1,5	9,6	5,3	74	97	–	111	–	1,5	0,097	0,127
65	83,7	111	43	47	M 75×2	8	1,5	9,6	–	79	83	107	116	0,4	1,5	0,098	0,127
	83,7	111	43	47	M 75×2	8	1,5	9,6	5,3	79	102	–	116	–	1,5	0,098	0,127
	91,4	130	64	68	M 75×2	12	2,1	9,1	–	82	105	120	138	2,2	2	0,11	0,099
70	88,5	115	45	49	M 80×2	8	1,5	9,6	–	84	98	110	121	1,2	1,5	0,099	0,127
	88,5	115	45	49	M 80×2	8	1,5	9,6	5,3	84	105	–	121	–	1,5	0,099	0,127
	98,5	135	68	72	M 80×2	12	2,1	13,1	–	87	110	130	148	2,2	2	0,103	0,107
75	98,1	125	48	52	M 90×2	8	2	9,1	–	91	105	120	129	1,2	2	0,104	0,121
	98,1	125	48	52	M 90×2	8	2	9,1	4,8	91	115	–	129	–	2	0,104	0,121
	102	145	71	75	M 90×2	12	2,1	10,1	–	92	115	135	158	2,4	2	0,107	0,101
80	104	133	52	56	M 95×2	9	2	7,1	–	96	110	125	139	1,3	2	0,114	0,105
	104	133	52	56	M 95×2	9	2	7,1	1,7	96	115	–	139	–	2	0,114	0,105
	110	153	74	78	M 95×2	13	3	12,1	–	99	125	145	166	2,4	2,5	0,105	0,105
85	112	144	53	57	M 100×2	9	2	9,5	–	101	120	130	149	1,4	2	0,104	0,117
	112	144	53	57	M 100×2	9	2	9,5	5,4	101	125	–	149	–	2	0,104	0,117
	119	166	79	83	M 100×2	14	3	9,6	–	104	135	155	176	2	2,5	0,108	0,101

[1] Width before sleeve is driven into bearing bore
[2] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[3] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

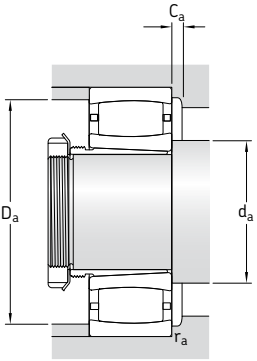
CARB toroidal roller bearings on withdrawal sleeve

d_1 **90 – 145** mm



Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass	Designations	
			dynamic	static		Reference	Limiting	Bearing +	Bearing	Withdrawal sleeve
d_1	D	B	C	C_0	P_u	speed	speed	sleeve		
mm			kN		kN	r/min		kg	–	
90	170	43	360	400	44	3 800	5 000	4,50	∗ **C 2219 K**[1)]	**AHX 319**
	200	67	610	695	73,5	2 800	4 000	11,0	∗ **C 2319 K**	**AHX 2319**
95	165	52	475	655	71	–	1 300	5,00	∗ **C 3120 KV**	**AHX 3120**
	180	46	415	465	47,5	3 600	4 800	5,30	∗ **C 2220 K**	**AHX 320**
	215	73	800	880	91,5	2 600	3 600	13,5	∗ **C 2320 K**	**AHX 2320**
105	170	45	355	480	51	3 200	4 500	4,25	∗ **C 3022 K**[1)]	**AHX 3122**
	180	69	670	1 000	102	–	900	7,75	∗ **C 4122 K30V**	**AH 24122**
	200	53	530	620	64	3 200	4 300	7,65	∗ **C 2222 K**	**AHX 3122**
115	180	46	375	530	55	3 000	4 000	4,60	∗ **C 3024 K**[1)]	**AHX 3024**
	180	46	430	640	67	–	1 400	4,75	∗ **C 3024 KV**	**AHX 3024**
	180	60	530	880	90	–	1 100	6,20	∗ **C 4024 K30V**	**AH 24024**
	180	60	430	640	65,5	–	1 400	5,65	∗ **C 4024 K30V/VE240**	**AH 24024**
	200	80	780	1 120	114	–	750	11,5	∗ **C 4124 K30V**[1)]	**AH 24124**
	215	58	610	710	72	3 000	4 000	9,50	∗ **C 2224 K**[1)]	**AHX 3124**
	215	76	750	980	98	2 400	3 200	13,0	∗ **C 3224 K**	**AHX 3224 G**
125	200	52	390	585	58,5	2 800	3 800	6,80	∗ **C 3026 K**[1)]	**AHX 3026**
	200	69	620	930	91,5	1 900	2 800	8,70	∗ **C 4026 K30**	**AH 24026**
	200	69	720	1 120	112	–	850	8,90	∗ **C 4026 K30V**	**AH 24026**
	210	80	750	1 100	108	–	670	11,5	∗ **C 4126 K30V/VE240**	**AH 24126**
	230	64	735	930	93	2 800	3 800	12,0	∗ **C 2226 K**	**AHX 3126**
135	210	53	490	735	72	2 600	3 400	7,30	∗ **C 3028 K**[1)]	**AHX 3028**
	210	69	750	1 220	118	–	800	9,50	∗ **C 4028 K30V**	**AH 24028**
	225	85	1 000	1 600	153	–	630	15,5	∗ **C 4128 K30V**	**AH 24128**
	250	68	830	1 060	102	2 400	3 400	15,5	∗ **C 2228 K**	**AHX 3128**
145	225	56	540	850	83	2 400	3 200	9,40	∗ **C 3030 KMB**[1)]	**AHX 3030**
	225	56	585	960	93	–	1 000	8,9	∗ **C 3030 KV**	**AH 3030**
	225	75	780	1 320	125	–	750	11,5	∗ **C 4030 K30V**	**AH 24030**
	250	80	880	1 290	122	2 000	2 800	16,5	∗ **C 3130 K**	**AHX 3130 G**
	250	100	1 220	1 860	173	–	450	22,0	∗ **C 4130 K30V**[1)]	**AH 24130**
	270	73	980	1 220	116	2 400	3 200	19,0	∗ **C 2230 K**	**AHX 3130 G**

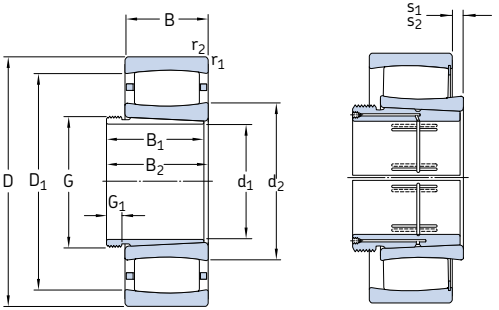
∗ SKF Explorer bearing
[1)] Please check availability of the bearing before incorporating it in a bearing arrangement design



Dimensions										Abutment and fillet dimensions						Calculation factors	
d_1	d_2 ~	D_1 ~	B_1	B_2[1] ~	G	G_1	$r_{1,2}$ min	s_1[2] ~	s_2[2] ~	d_a min	d_a max	D_a min	D_a max	C_a[3] min	r_a max	k_1	k_2
mm										mm						–	
90	113	149	57	61	M 105×2	10	2,1	10,5	–	107	112	149	158	4,2	2	0,114	0,104
	120	166	85	89	M 105×2	16	3	12,6	–	109	135	155	186	2,1	2,5	0,103	0,106
95	119	150	64	68	M 110×2	11	2	10	4,7	111	130	–	154	–	2	0,1	0,112
	118	157	59	63	M 110×2	10	2,1	10,1	–	112	130	150	168	0,9	2	0,108	0,11
	126	185	90	94	M 110×2	16	3	11,2	–	114	150	170	201	3,2	2,5	0,113	0,096
105	128	156	68	72	M 120×2	11	2	9,5	–	119	127	157	161	4	2	0,107	0,11
	132	163	82	91	M 115×2	13	2	11,4	4,6	120	145	–	170	–	2	0,111	0,097
	132	176	68	72	M 120×2	11	2,1	11,1	–	122	150	165	188	1,9	2	0,113	0,103
115	138	166	60	64	M 130×2	13	2	10,6	–	129	145	160	171	0,9	2	0,111	0,109
	138	166	60	64	M 130×2	13	2	10,6	3,8	129	150	–	171	–	2	0,111	0,109
	140	164	73	82	M 125×2	13	2	12	5,2	129	150	–	171	–	2	0,109	0,103
	139	164	73	82	M 125×2	13	2	–	17,8	130	152	142	170	–	2	0,085	0,142
	140	176	93	102	M 130×2	13	2	18	11,2	131	140	–	189	–	2	0,103	0,103
	144	191	75	79	M 130×2	12	2,1	13	–	132	143	192	203	5,4	2	0,113	0,103
	149	190	90	94	M 130×2	13	2,1	17,1	–	132	160	180	203	2,4	2	0,103	0,108
125	154	180	67	71	M 140×2	14	2	16,5	–	139	152	182	191	4,4	2	0,123	0,1
	149	181	83	93	M 140×2	14	2	11,4	–	139	155	175	191	1,9	2	0,113	0,097
	149	181	83	93	M 135×2	14	2	11,4	4,6	139	165	–	191	–	2	0,113	0,097
	153	190	94	104	M 140×2	14	2	9,7	9,7	141	170	–	199	–	2	0,09	0,126
	152	199	78	82	M 140×2	12	3	9,6	–	144	170	185	216	1,1	2,5	0,113	0,101
135	163	194	68	73	M 150×2	14	2	11	–	149	161	195	201	4,7	2	0,102	0,116
	161	193	83	93	M 145×2	14	2	11,4	5,9	149	175	–	201	–	2	0,115	0,097
	167	203	99	109	M 150×2	14	2,1	12	5,2	151	185	–	214	–	2	0,111	0,097
	173	223	83	88	M 150×2	14	3	13,7	–	154	190	210	236	2,3	2,5	0,109	0,108
145	173	204	72	77	M 160×3	15	2,1	8,7	–	161	172	200	214	1,3	2	–	0,108
	174	204	72	77	M 160×3	15	2,1	14,1	7,3	161	190	177	214	–	2	0,113	0,108
	173	204	90	101	M 155×3	15	2,1	17,4	10,6	161	185	–	214	–	2	0,107	0,106
	182	226	96	101	M 160×3	15	2,1	13,9	–	162	195	215	238	2,3	2	0,12	0,092
	179	222	115	126	M 160×3	15	2,1	20	10,1	162	175	–	228	–	2	0,103	0,103
	177	236	96	101	M 160×3	15	3	11,2	–	164	200	215	256	2,5	2,5	0,119	0,096

[1] Width before sleeve is driven into bearing bore
[2] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[3] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

CARB toroidal roller bearings on withdrawal sleeve
d_1 **150 – 220** mm

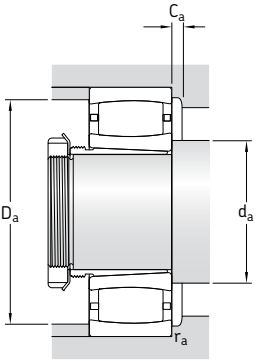


Bearing on withdrawal sleeve of AH design

Bearing on withdrawal sleeve of AOH design for oil injection

Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Reference speed	Limiting speed	Mass Bearing + sleeve	Designations Bearing	Withdrawal sleeve
d_1	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
150	240	60	600	980	93	2 200	3 000	11,5	★ **C 3032 K**[1]	**AH 3032**
	240	80	795	1 160	110	1 600	2 400	14,7	★ **C 4032 K30**	**AH 24032**
	240	80	915	1 460	140	–	600	15,0	★ **C 4032 K30V**	**AH 24032**
	270	86	1 000	1 400	129	1 900	2 600	24,0	★ **C 3132 KMB**	**AH 3132 G**
	270	109	1 460	2 160	200	–	300	29,0	★ **C 4132 K30V**[1]	**AH 24132**
	290	104	1 370	1 830	170	1 700	2 400	31,0	★ **C 3232 K**	**AH 3232 G**
160	260	67	750	1 160	108	2 000	2 800	15,0	★ **C 3034 K**[1]	**AH 3034**
	260	90	1 140	1 860	170	–	480	20,0	★ **C 4034 K30V**	**AH 24034**
	280	88	1 040	1 460	137	1 900	2 600	24,0	★ **C 3134 K**[1]	**AH 3134 G**
	280	109	1 530	2 280	208	–	280	30,0	★ **C 4134 K30V**[1]	**AH 24134**
	310	86	1 270	1 630	150	2 000	2 600	31,0	★ **C 2234 K**	**AH 3134 G**
170	280	74	880	1 340	125	1 900	2 600	19,0	★ **C 3036 K**	**AH 3036**
	280	100	1 320	2 120	193	–	430	26,0	★ **C 4036 K30V**	**AH 24036**
	300	96	1 250	1 730	156	1 800	2 400	30,0	★ **C 3136 K**	**AH 3136 G**
	300	118	1 760	2 700	240	–	220	38,0	★ **C 4136 K30V**[1]	**AH 24136**
	320	112	1 530	2 200	196	1 500	2 000	41,5	★ **C 3236 K**	**AH 3236 G**
180	290	75	930	1 460	132	1 800	2 400	20,5	★ **C 3038 K**	**AH 3038 G**
	290	100	1 370	2 320	204	–	380	28,0	★ **C 4038 K30V**[1]	**AH 24038**
	320	104	1 530	2 200	196	1 600	2 200	38,0	★ **C 3138 K**[1]	**AH 3138 G**
	320	128	2 040	3 150	275	–	130	47,5	★ **C 4138 K30V**[1]	**AH 24138**
	340	92	1 370	1 730	156	1 800	2 400	38,0	★ **C 2238 K**	**AH 2238 G**
190	310	82	1 120	1 730	153	1 700	2 400	25,5	★ **C 3040 K**	**AH 3040 G**
	310	109	1 630	2 650	232	–	260	34,5	★ **C 4040 K30V**	**AH 24040**
	340	112	1 600	2 320	204	1 500	2 000	45,5	★ **C 3140 K**	**AH 3140**
	340	140	2 360	3 650	315	–	80	59,0	★ **C 4140 K30V**[1]	**AH 24140**
200	340	90	1 320	2 040	176	1 600	2 200	36,0	★ **C 3044 K**	**AOH 3044 G**
	340	118	1 930	3 250	275	–	200	48,0	★ **C 4044 K30V**[1]	**AOH 24044**
	370	120	1 900	2 900	245	1 400	1 900	60,0	★ **C 3144 K**	**AOH 3144**
	400	108	2 000	2 500	216	1 500	2 000	65,5	★ **C 2244 K**	**AOH 2244**
220	360	92	1 340	2 160	180	1 400	2 000	39,5	★ **C 3048 K**	**AOH 3048**
	400	128	2 320	3 450	285	1 300	1 700	75,0	★ **C 3148 K**	**AOH 3148**

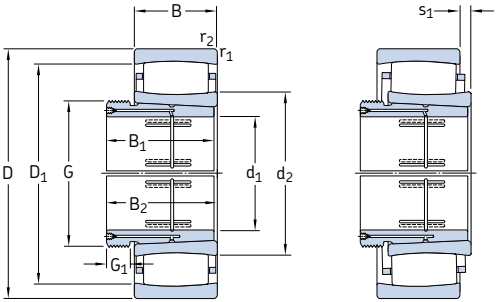
★ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



Dimensions										Abutment and fillet dimensions						Calculation factors	
d_1	d_2 ~	D_1 ~	B_1	B_2[1] ~	G	G_1	$r_{1,2}$ min	s_1[2] ~	s_2[2] ~	d_a min	d_a max	D_a min	D_a max	C_a[3] min	r_a max	k_1	k_2
mm										mm						–	
150	187	218	77	82	M 170×3	16	2,1	15	–	171	186	220	229	5,1	2	0,115	0,106
	181	217	95	106	M 170×3	15	2,1	18,1	–	171	190	210	229	2,2	2	0,109	0,103
	181	217	95	106	M 170×3	15	2,1	18,1	8,2	171	195	–	229	–	2	0,109	0,103
	190	240	103	108	M 170×3	16	2,1	10,3	–	172	189	229	258	3,8	2	–	0,099
	190	241	124	135	M 170×3	15	2,1	21	11,1	172	190	–	258	–	2	0,101	0,105
	194	256	124	130	M 170×3	20	3	19,3	–	174	215	245	276	2,6	2,5	0,112	0,096
160	200	237	85	90	M 180×3	17	2,1	12,5	–	181	200	238	249	5,8	2	0,105	0,112
	195	235	106	117	M 180×3	16	2,1	17,1	7,2	181	215	–	249	–	2	0,108	0,103
	200	249	104	109	M 180×3	16	2,1	21	–	182	200	250	268	7,6	2	0,101	0,109
	200	251	125	136	M 180×3	16	2,1	21	11,1	182	200	–	268	–	2	0,101	0,106
	209	274	104	109	M 180×3	16	4	16,4	–	187	230	255	293	3	3	0,114	0,1
170	209	251	92	98	M 190×3	17	2,1	15,1	–	191	220	240	269	2	2	0,112	0,105
	203	247	116	127	M 190×3	16	2,1	20,1	10,2	191	225	–	269	–	2	0,107	0,103
	210	266	116	122	M 190×3	19	3	23,2	–	194	230	255	286	2,2	2,5	0,102	0,111
	211	265	134	145	M 190×3	16	3	20	10,1	194	210	–	286	–	2,5	0,095	0,11
	228	289	140	146	M 190×3	24	4	27,3	–	197	245	275	303	3,2	3	0,107	0,104
180	225	266	96	102	M 200×3	18	2,1	16,1	–	201	235	255	279	1,9	2	0,113	0,107
	220	263	118	131	M 200×3	18	2,1	20	10,1	201	220	–	279	–	2	0,103	0,106
	228	289	125	131	M 200×3	20	3	19	–	204	227	290	306	9,1	2,5	0,096	0,113
	222	284	146	159	M 200×3	18	3	20	10,1	204	220	–	306	–	2,5	0,094	0,111
	224	296	112	117	M 200×3	18	4	22,5	–	207	250	275	323	1,6	3	0,108	0,108
190	235	285	102	108	Tr 210×4	19	2,1	15,2	–	211	250	275	299	2,9	2	0,123	0,095
	229	280	127	140	Tr 210×4	18	2,1	21	11,1	211	225	–	299	–	2	0,11	0,101
	245	305	134	140	Tr 220×4	21	3	27,3	–	214	260	307	326	–	2,5	0,108	0,104
	237	302	158	171	Tr 210×4	18	3	22	12,1	214	235	–	326	–	2,5	0,092	0,112
200	257	310	111	117	Tr 230×4	20	3	17,2	–	233	270	295	327	3,1	2,5	0,114	0,104
	251	306	138	152	Tr 230×4	20	3	20	10,1	233	250	–	327	–	2,5	0,095	0,113
	268	333	145	151	Tr 240×4	23	4	22,3	–	237	290	315	353	3,5	3	0,114	0,097
	259	350	130	136	Tr 240×4	20	4	20,5	–	237	295	320	383	1,7	3	0,113	0,101
220	276	329	116	123	Tr 260×4	21	3	19,2	–	253	290	315	347	1,3	2,5	0,113	0,106
	281	357	154	161	Tr 260×4	25	4	20,4	–	257	305	335	383	3,7	3	0,116	0,095

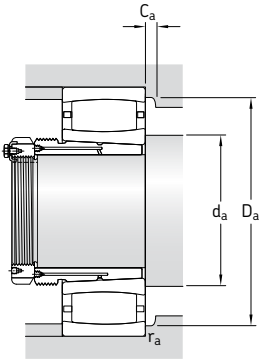
[1] Width before sleeve is driven into bearing bore
[2] Permissible axial displacement from normal position of one bearing ring relative the other (→ **page 787**)
[3] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

CARB toroidal roller bearings on withdrawal sleeve
d_1 **240 – 460** mm



Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass	Designations	
			dynamic	static		Reference speed	Limiting speed	Bearing + sleeve	Bearing	Withdrawal sleeve
d_1	D	B	C	C_0	P_u					
mm			kN		kN	r/min		kg	–	
240	400	104	1 760	2 850	232	1 300	1 800	55,5	*** C 3052 K**	**AOH 3052**
	440	144	2 650	4 050	325	1 100	1 500	102	*** C 3152 K**	**AOH 3152 G**
260	420	106	1 860	3 100	250	1 200	1 600	61,0	*** C 3056 K**	**AOH 3056**
	460	146	2 850	4 500	355	1 100	1 400	110	*** C 3156 K**	**AOH 3156 G**
280	460	118	2 160	3 750	290	1 100	1 500	84,0	*** C 3060 KM**	**AOH 3060**
	460	160	2 900	4 900	380	850	1 200	110	*** C 4060 K30M**[1]	**AOH 24060 G**
	500	160	3 250	5 200	400	1 000	1 300	140	*** C 3160 K**	**AOH 3160 G**
	500	200	4 150	6 700	520	750	1 000	185	*** C 4160 K30MB**	**AOH 24160**
300	480	121	2 280	4 000	310	1 000	1 400	93,0	*** C 3064 KM**	**AOH 3064 G**
	540	176	4 150	6 300	480	950	1 300	185	*** C 3164 KM**	**AOH 3164 G**
320	520	133	2 900	5 000	375	950	1 300	120	*** C 3068 KM**[1]	**AOH 3068 G**
	580	190	4 900	7 500	560	850	1 200	230	*** C 3168 KM**	**AOH 3168 G**
340	540	134	2 900	5 000	375	900	1 200	125	*** C 3072 KM**[1]	**AOH 3072 G**
	600	192	5 000	8 000	585	800	1 100	245	*** C 3172 KM**	**AOH 3172 G**
360	560	135	3 000	5 200	390	900	1 200	130	*** C 3076 KM**[1]	**AOH 3076 G**
	620	194	4 400	7 200	520	750	1 000	270	*** C 3176 KMB**	**AOH 3176 G**
380	600	148	3 650	6 200	450	800	1 100	165	*** C 3080 KM**[1]	**AOH 3080 G**
	650	200	4 800	8 300	585	700	950	285	*** C 3180 KM**	**AOH 3180 G**
400	620	150	3 800	6 400	465	850	1 200	175	*** C 3084 KM**	**AOH 3084 G**
	700	224	6 000	10 400	710	800	1 100	380	*** C 3184 KM**	**AOH 3184 G**
420	650	157	3 750	6 400	465	800	1 100	215	*** C 3088 KMB**	**AOHX 3088 G**
	720	226	6 700	11 400	780	630	850	420	*** C 3188 KMB**	**AOHX 3188 G**
	720	280	7 500	12 900	900	500	670	510	*** C 4188 K30MB**	**AOH 24188**
440	680	163	4 000	7 500	510	700	950	230	*** C 3092 KM**	**AOHX 3092 G**
	760	240	6 800	12 000	800	600	800	480	*** C 3192 KM**	**AOHX 3192 G**
	760	300	8 300	14 300	950	480	630	585	*** C 4192 K30M**	**AOH 24192**
460	700	165	4 050	7 800	530	670	900	245	*** C 3096 KM**	**AOHX 3096 G**
	790	248	6 950	12 500	830	560	750	545	*** C 3196 KMB**[1]	**AOHX 3196 G**

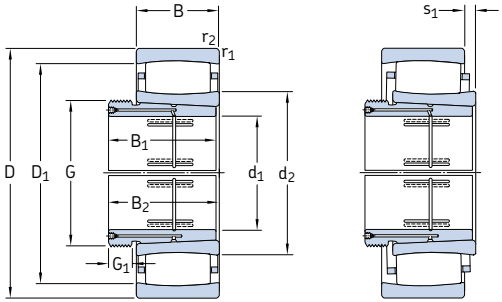
* SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



Dimensions									Abutment and fillet dimensions						Calculation factors	
d_1	d_2 ~	D_1 ~	B_1	B_2[1] ~	G	G_1	$r_{1,2}$ min	s_1[2] ~	d_a min	d_a max	D_a min	D_a max	C_a[3] min	r_a max	k_1	k_2
mm									mm						–	
240	305	367	128	135	Tr 280×4	23	4	19,3	275	325	350	385	3,4	3	0,122	0,096
	314	394	172	179	Tr 280×4	26	4	26,4	277	340	375	423	4,1	3	0,115	0,096
260	328	389	131	139	Tr 300×4	24	4	21,3	295	350	375	405	1,8	3	0,121	0,098
	336	416	175	183	Tr 300×5	28	5	28,4	300	360	395	440	4,1	4	0,115	0,097
280	352	417	145	153	Tr 320×5	26	4	20	315	375	405	445	1,7	3	0,123	0,095
	338	409	184	202	Tr 320×5	24	4	30,4	315	360	400	445	2,8	3	0,105	0,106
	362	448	192	200	Tr 320×5	30	5	30,5	320	390	425	480	4,9	4	0,106	0,106
	354	448	224	242	Tr 320×5	24	5	14,9	320	353	424	480	3,4	4	–	0,097
300	376	440	149	157	Tr 340×5	27	4	23,3	335	395	430	465	1,8	3	0,121	0,098
	372	476	209	217	Tr 340×5	31	5	26,7	340	410	455	520	3,9	4	0,114	0,096
320	402	482	162	171	Tr 360×5	28	5	25,4	358	430	465	502	1,9	4	0,12	0,099
	405	517	225	234	Tr 360×5	33	5	25,9	360	445	490	560	4,2	4	0,118	0,093
340	417	497	167	176	Tr 380×5	30	5	26,4	378	445	480	522	2	4	0,12	0,099
	423	537	229	238	Tr 380×5	35	5	27,9	380	460	510	522	3,9	4	0,117	0,094
360	431	511	170	180	Tr 400×5	31	5	27	398	460	495	542	2	4	0,12	0,1
	446	551	232	242	Tr 400×5	36	5	25,4	400	445	526	600	7,3	4	–	0,106
380	458	553	183	193	Tr 420×5	33	5	30,6	418	480	525	582	2,1	4	0,121	0,099
	488	589	240	250	Tr 420×5	38	6	50,7	426	526	564	624	2,5	5	0,106	0,109
400	475	570	186	196	Tr 440×5	34	5	32,6	438	510	550	602	2,2	4	0,12	0,1
	508	618	266	276	Tr 440×5	40	6	34,8	446	540	595	674	3,8	5	0,113	0,098
420	491	587	194	205	Tr 460×5	35	6	19,7	463	489	565	627	1,7	5	–	0,105
	522	647	270	281	Tr 460×5	42	6	16	466	521	613	694	7,5	5	–	0,099
	510	637	310	332	Tr 460×5	30	6	27,8	466	509	606	694	7,3	5	–	0,1
440	539	624	202	213	Tr 480×5	37	6	33,5	486	565	605	654	2,3	5	0,114	0,108
	559	679	285	296	Tr 480×6	43	7,5	51	492	570	655	728	4,2	6	0,108	0,105
	540	670	332	355	Tr 480×5	32	7,5	46,2	492	570	655	728	5,6	6	0,111	0,097
460	555	640	205	217	Tr 500×6	38	6	35,5	503	580	625	677	2,3	5	0,113	0,11
	583	700	295	307	Tr 500×6	45	7,5	24	512	580	705	758	20,6	6	–	0,104

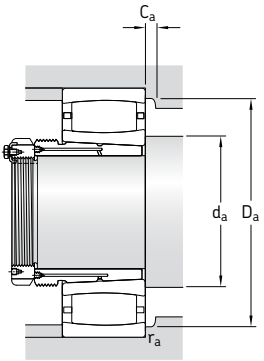
[1] Width before sleeve is driven into bearing bore
[2] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[3] Minimum width of free space for bearings with cage in normal position (→ **page 792**)

CARB toroidal roller bearings on withdrawal sleeve
d_1 **480 – 950** mm



Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings		Mass		Designations	
			dynamic	static		Reference speed	Limiting speed	Bearing + sleeve	Bearing	Withdrawal sleeve
d_1	D	B	C	C_0	P_u				–	
mm			kN		kN	r/min		kg	–	
480	720	167	4 250	8 300	560	630	900	265	∗ **C 30/500 KM**	**AOHX 30/500 G**
	830	264	7 500	12 700	850	530	750	615	∗ **C 31/500 KM**	**AOHX 31/500 G**
	830	325	10 200	18 600	1 220	430	560	780	∗ **C 41/500 K30MB**	**AOH 241/500**
500	780	185	5 100	9 500	640	600	800	355	∗ **C 30/530 KM**	**AOH 30/530**
	870	272	8 800	15 600	1 000	500	670	720	∗ **C 31/530 KM**	**AOH 31/530**
530	820	195	5 600	11 000	720	600	850	415	∗ **C 30/560 KM**	**AOHX 30/560**
	920	280	9 500	17 000	1 100	530	750	855	∗ **C 31/560 KMB**[1]	**AOH 31/560**
570	870	200	6 300	12 200	780	500	700	460	∗ **C 30/600 KM**	**AOHX 30/600**
	980	300	10 200	18 000	1 140	430	600	1 020	∗ **C 31/600 KMB**	**AOHX 31/600**
	980	375	12 900	23 200	1 460	340	450	1 270	∗ **C 41/600 K30MB**	**AOHX 241/600**
600	920	212	6 800	12 900	830	480	670	555	∗ **C 30/630 KM**	**AOH 30/630**
	1 030	315	11 800	20 800	1 290	400	560	1 200	∗ **C 31/630 KMB**	**AOH 31/630**
630	980	230	8 150	16 300	1 000	430	600	705	∗ **C 30/670 KM**	**AOH 30/670**
	1 090	336	12 000	22 000	1 320	380	530	1 410	∗ **C 31/670 KMB**[1]	**AOHX 31/670**
670	1 030	236	8 800	17 300	1 060	450	630	780	∗ **C 30/710 KM**	**AOHX 30/710**
	1 030	315	10 600	21 600	1 290	400	560	1 010	∗ **C 40/710 K30M**	**AOH 240/710 G**
	1 150	345	12 700	24 000	1 430	360	480	1 600	∗ **C 31/710 KMB**[1]	**AOHX 31/710**
710	1 090	250	9 500	19 300	1 160	380	530	975	∗ **C 30/750 KMB**	**AOH 30/750**
	1 220	365	13 700	30 500	1 800	320	450	1 990	∗ **C 31/750 KMB**	**AOH 31/750**
750	1 150	258	9 150	18 600	1 120	360	480	1 060	∗ **C 30/800 KMB**	**AOH 30/800**
	1 280	375	15 600	30 500	1 760	300	400	2 170	∗ **C 31/800 KMB**[1]	**AOH 31/800**
800	1 220	272	11 600	24 500	1 430	320	450	1 300	∗ **C 30/850 KMB**	**AOH 30/850**
	1 360	400	16 000	32 000	1 830	280	380	2 600	∗ **C 31/850 KMB**[1]	**AOH 31/850**
850	1 280	280	12 700	26 500	1 530	300	400	1 400	∗ **C 30/900 KMB**	**AOH 30/900**
900	1 360	300	12 900	27 500	1 560	280	380	1 700	∗ **C 30/950 KMB**[1]	**AOH 30/950**
950	1 420	308	13 400	29 000	1 630	260	340	1 880	∗ **C 30/1000 KMB**[1]	**AOH 30/1000**
	1 580	462	22 800	45 500	2 500	220	300	3 950	∗ **C 31/1000 KMB**[1]	**AOH 31/1000**

∗ SKF Explorer bearing
[1] Please check availability of the bearing before incorporating it in a bearing arrangement design



Dimensions									Abutment and fillet dimensions						Calculation factors	
d_1	d_2 ~	D_1 ~	B_1	B_2[1] ~	G	G_1	$r_{1,2}$ min	s_1[2] ~	d_a min	d_a max	D_a min	D_a max	C_a[3] min	r_a max	k_1	k_2
mm									mm						–	
480	572	656	209	221	Tr 530×6	40	6	37,5	523	600	640	697	2,3	5	0,113	0,111
	605	738	313	325	Tr 530×6	47	7,5	75,3	532	655	705	798	–	6	0,099	0,116
	598	740	360	383	Tr 530×6	35	7,5	15	532	597	703	798	4,4	6	–	0,093
500	601	704	230	242	Tr 560×6	45	6	35,7	553	635	685	757	2,5	5	0,12	0,101
	635	781	325	337	Tr 560×6	53	7,5	44,4	562	680	745	838	4,8	6	0,115	0,097
530	660	761	240	252	Tr 600×6	45	6	45,7	583	695	740	793	2,7	5	0,116	0,106
	664	808	335	347	Tr 600×6	55	7,5	28	592	660	810	888	23,8	6	–	0,111
570	692	805	245	259	Tr 630×6	45	6	35,9	623	725	775	847	2,7	5	0,125	0,098
	705	871	355	369	Tr 630×6	55	7,5	26,1	632	704	827	948	5,1	6	–	0,107
	697	869	413	439	Tr 630×6	38	7,5	24,6	632	696	823	948	5,5	6	–	0,097
600	717	840	258	272	Tr 670×6	46	7,5	48,1	658	755	810	892	2,9	6	0,118	0,104
	741	916	375	389	Tr 670×6	60	7,5	23,8	662	740	868	998	5,7	6	–	0,102
630	775	904	280	294	Tr 710×7	50	7,5	41,1	698	820	875	952	2,9	6	0,121	0,101
	797	963	395	409	Tr 710×7	59	7,5	33	702	795	965	1 058	28	6	–	0,104
670	807	945	286	302	Tr 750×7	50	7,5	47,3	738	850	910	1 002	3,2	6	0,119	0,104
	803	935	360	386	Tr 750×7	45	7,5	51,2	738	840	915	1 002	4,4	6	0,113	0,101
	848	1 012	405	421	Tr 750×7	60	9,5	34	750	845	1 015	1 100	28,6	8	–	0,102
710	854	993	300	316	Tr 800×7	50	7,5	28,6	778	852	961	1 062	7,4	6	–	0,11
	884	1 077	425	441	Tr 800×7	60	9,5	33	790	883	1 025	1 180	9,3	8	–	0,094
750	888	1 076	308	326	Tr 850×7	50	9,5	36	790	885	1 080	1 180	31,5	8	–	0,117
	947	1 133	438	456	Tr 850×7	63	9,5	37	840	945	1 135	1 240	32,1	8	–	0,115
800	964	1 113	325	343	Tr 900×7	53	7,5	24	878	963	1 077	1 192	7,7	6	–	0,097
	1 020	1 200	462	480	Tr 900×7	62	12	40	898	1 015	1 205	1 312	33,5	10	–	0,11
850	1 004	1 173	335	355	Tr 950×8	55	7,5	25,5	928	1 002	1 124	1 252	3,3	6	_	0,1
900	1 080	1 240	355	375	Tr 1000×8	55	7,5	30	978	1 075	1 245	1 322	26,2	6	–	0,116
950	1 136	1 294	365	387	Tr 1060×8	57	7,5	30	1 028	1 135	1 295	1 392	26,7	6	–	0,114
	1 179	1 401	525	547	Tr 1060×8	63	12	46	1 048	1 175	1 405	1 532	38,6	10	–	0,105

[1] Width before sleeve is driven into bearing bore
[2] Permissible axial displacement from normal position of one bearing ring relative to the other (→ **page 787**)
[3] Minimum width of free space for bearings with cage in normal position (→ **page 792**)