QCB Bearings

SPHERICAL ROLLER BEARING





Warranty

QCB deep grove ball bearings are guaranteed for 12 months after delivery to be free from material defect and manufacturing or assembly error. Any perceived faults should be documented and reported to QCB.

Limitation of Liability

The information in this manual is distilled from best practices, national standards and our own extensive experience.

QCB assumes no liability for damage arising from ding efficient and economical solutions for customers.

- Improper selection of product by the customer
- Failure to follow the instructions and information in this manual
- Improper use of the product
- The use of untrained personnel
- Any modification to the product as delivered

CAT 2026 Revision 1

In the interest of continuous product improvement, QCB reserves the right to modify any product or specification. All weights and measures are approximate and for guidance only.

Detailed & up to date information is available from the QCB Technical Department or www.QCBbearings.com

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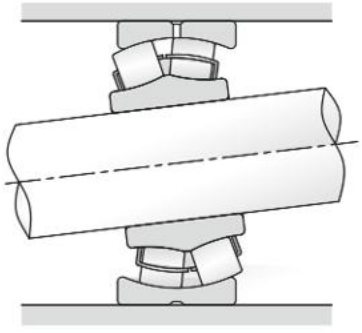
Brief introduction

Spherical Roller Bearings

Spherical roller bearings are self–aligning bearings, comprising solid outer ring with a concave raceway, solid inner ring and two rows of barrel rollers with cages. The centre point of the sphere in the outer ring raceway is at the bearing axis. Therefore, the bearings are self–aligning and insensitive to misalignment of the shaft relative to the housing, which can be caused, for example, by shaft deflection. Spherical roller bearings are designed to accommodate heavy radial loads, as well as heavy axial loads in both directions. Due to these features, this kind of bearings are suitable for heavy machines that assembly error can' t be avoided, such as paper–making, mining, vibration screen, rolling mill and so on.

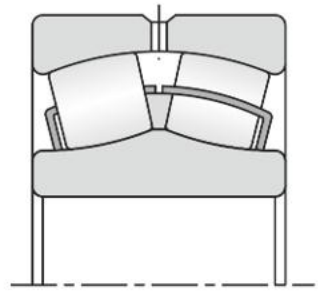
Various types exist that differ by internal design, including bearings with a tapered bore inner caliber. The bearings are easily mounted on the shaft with an adapter or un–mounting sleeve, and are used in many industrial machines for their high load capacity.



Designs and Features

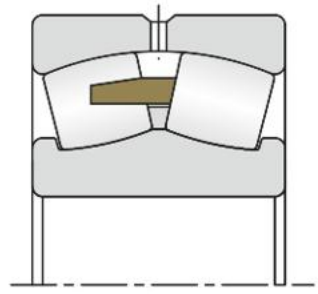
Depending on their series and size, standard spherical roller bearings are manufactured to one of following basic designs:

C and CC design bearings have two stamped window–type steel cages, an inner ring without flanges and a floating guide ring centered on the inner ring. The CC design has optimized profile of rollers and raceways, which is conductive to the self–guiding of rollers during operation and reduce the friction. The designs are suffixed with C or CC.



CC Design

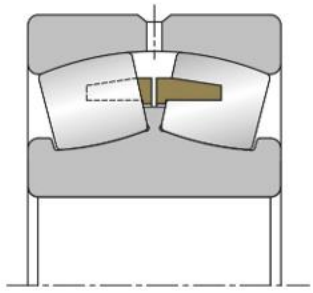
CA bearings have a machined double prong–type brass cage, an inner ring with a retaining flange on both sides and a floating guide ring centered on the inner ring. The flanges on the inner ring are designed to keep the rollers in place when swiveling the bearing during mounting or maintenance. The flanges are not designed to guide the rollers or accommodate any axial load. The CAC design has optimized profile of rollers and raceways, which is conductive to the self–guiding of rollers during operation and reduce the friction. The design is indicated by the designation suffix CA or CAC.



CA Design

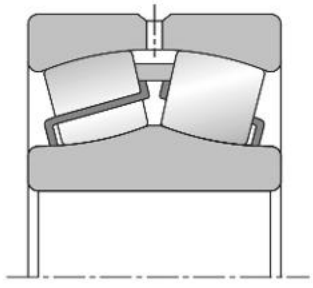
MB design bearings have two piece machined brass cage, an inner ring with flange on both sides and a fixed middle flange. An improve–ment over the conventional BR design, these bearings in corporate strengthened symmetric rollers, and are equivalent to C design in load capacity.

Brief introduction



MB Design

E design bearings have two stamped window–type steel cages, an inner ring without flanges and a floating guide ring centered on the inner ring (d ≤ 65 mm) or on the cages (d > 65 mm). They have an annular groove and three lubrication holes in the outer ring. E design bearings are indicated by th designation suffix E. All E design bearings have an optimized internal design for increased load carrying capacity.



E Design

Sealed Bearings

Bearing configuration for heavy duty or poor working conditions which the sealed solutions is specially required, sealed spherical roller bearings can be supplied. The bearings are prefixed with BS2–, for example BS2–2214–2CS, are based on 222 or 223 series bearings, but are slightly wider to accommodate the seals.

Sealed spherical roller bearings have the same features and internal design as basic design spherical roller bearings and are available with a cylindrical bore as standard. Some sizes are also available with a tapered bore.

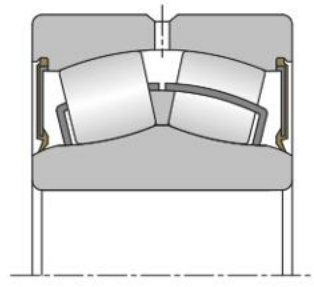
Sealed spherical roller bearings have a contact seal reinforced with a sheet steel insert, the seals are fitted in a recess on the outer ring and seal against the inner ring. The seals are corrosion durable and anti–aging. The bearings can be fitted with seals made of one of the following materials:

- NBR (designation suffix CS)
- FKM (designation suffix CS2)

The bearings fitted NBR seals can work properly under the ambient temperature –40℃~100℃, and are filled with moderate quantity of Lithium base grease before leaving the factory. If customers have a special requirement, other brands of grease can be supplied, or the filling quantity can be adjusted according to the operation speed.

Bearings fitted with FKM seals can work in good conditions under the ambient temperature –30℃~250℃. The internal space are occupied with proper amount of high temperature grease due to the rotation speed, the permissible temperature is –20℃~220℃, but hazardous gas will be released when the seals are exposed to flame or temperature above 300℃.

Sealed spherical roller bearings are supplied lubrication and should not be washed. For many application conditions, the bearings do not required relubrication and can be considered relubrication–free. However, under heavy load and high speed, or temperature over +70℃, the bearings need to be relubricated via the annular groove in the outer ring. It is not recommended heating sealed spherical roller bearings above 80℃ during the mounting process, otherwise it is easy to damage seals or make grease deteriorate and loss.



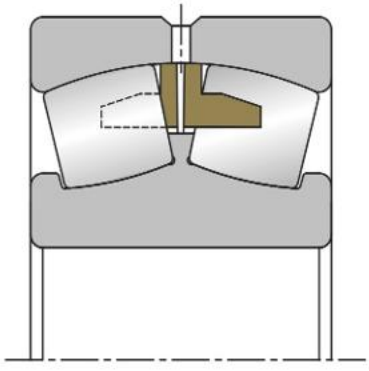
Sealed Design

Brief introduction

Vibrating Machine Bearing

QCB has developed spherical roller bearing specialize for vibratory applications. These bearings have the same boundary dimensions as series 223.. and suffixed with VB. These bearings are matched to the particularly for difficult conditions in vibratory machines, such as vibration screen, crusher etc. The bearings must be able to support not only high loads and speeds but also accelerations and centrifugal forces. They are suitable for dynamic angular misalignments up to 0,15° .

The inner ring has one integrated central rib and two flanges on both sides, thus the bearings can accommodate axial loads. The cage consists of two pieces machined cages guided on the outer ring. The dimensional tolerances and running accuracy are restricted and the radial internal clearance is C4. The bearings are available both with cylindrical bore and tapered bore.



Split Bearing

Split spherical roller bearings are primarily used for bearing positions which are difficult to access such as on long shafts which require support at several positions, or on cranked shafts. Their use is also beneficial where non–split bearings would require considerable time and effort for maintenance and more particularly for replacement; this would also cause long and expensive, or perhaps even inadmissibly long machine downtime. Split spherical roller bearings offer the optimum solution to such problems. The main application areas include conveyor equipment, long multiple–supported shafts and large ventilation plants.

Split spherical roller bearings have a cylindrical bore. The inner ring, outer ring and cage with the roller set are split in half. The split bearing rings are held together by screws or clamping rings.

QCB split spherical roller bearings are produced to order. The design is tailored to the particular application, and for cost reasons, is generally based on available bearings of standard design. Before finalizing a bearing arrangement design incorporating a split spherical roller bearing it is advisable to consult the QCB application engineering service.



Other Design Features

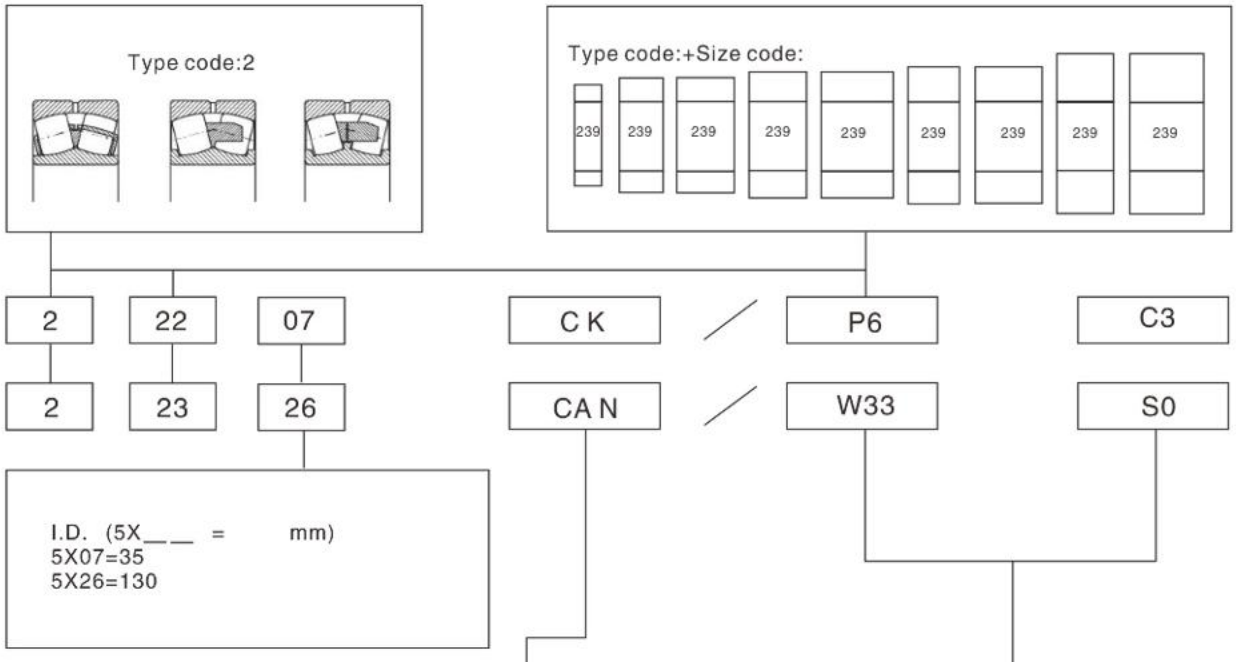
Annular groove and lubrication holes

QCB spherical roller bearings are available with an annular groove and three lubrication holes in the outer ring (designation suffix W33) or three lubrication holes in the outer ring (designation suffix W20).

Tapered bore

Spherical roller bearings with cylindrical bore are the normal type, but tapered bore with the taper 1:12(suffixed with K) or 1:30(suffixed with K30, suitable for 241, 240 series) is also available. In this case, the bearings can be interference fitted on the tapered shaft or on the cylindrical shaft using an adapter sleeve, it will be very convenient to mounted and dismounted. The degree of interference can be measured by the reduction of clearance or the bearing displacement on the shaft.

Designation System



Suffixes

Group 1: Internal design

CC: Symmetric roller, flangeless inner ring, two stamped steel cages
CA: Symmetric roller, retaining flanges on inner ring, guide ring centred on the inner ring, machined brass cage
E: Optimized design for increased load carrying capacity, 213, 222, 223 series: Flangeless inner ring and two stamped steel cages. Annular groove and three lubrication holes in the outer ring.
d≤65mm: Guide ring centred on the inner ring
d>65mm: Guide ring centred on the cage

Group 2: External design(seals, snap ring groove etc.)

-CC, -2CC: Contact seal, NBR, on one or both sides
-CS2, -2CS2: Contact seal, FKM, on one or both side
-K: Tapered bore, taper 1:12
-K30: Tapered bore, taper:1:30

Group 3: Cage design

F1: Machined steel cage
TN1: Nylon cage
MA: Machined brass cage, outer ring centred
MB: Machined brass cage, inner ring centred

Group 4.1: Material, heat treatment

Group 4.2: Accuracy, clearance, quiet running

/P0: Dimension and running accuracy to P0 class
/P6: Dimension and running accuracy to P6 class
/P5: Dimension and running accuracy to P5 class
/C0: Basic group clearance, code can be omitted
/C2: Less than basic group clearance
/C3: The clearance is larger than the C0 group
/C4: The clearance is larger than C3 group
/C5: The clearance is larger than C4 group
/C9X: Special clearance

Group 4.3: Bearing sets, matched bearings

Group 4.4: Stabilization

/S0: Working temperature up to 150℃
/S1: Working temperature up to 200℃
/S2: Working temperature up to 250℃
/S3: Working temperature up to 300℃
/S4: Working temperature up to 350℃

Group 4.5: Lubrication

W33: Annular groove and three lubrication holes in the outer ring
W20: Three lubrication holes in outer ring, without annular groove.

Group 4.6: Other variants

Designation System

Permissible Angular Misalignment

Spherical roller bearings can be self–aligning, without affecting the performance of the bearing, it is allowed a certain of angular error exists between the inner ring and outer ring. Under normal load and operating conditions(C/P>10), if the angular error between the inner ring and the outer ring is constant, the reference value of the permissible angular error given in the table below can be applied. The full application of these reference values depends on the design of the bearing arrangement and the seal type used.

In some cases, the angular error between the inner ring and outer ring is changed, such as: vibrating screen is the case of unbalanced rotation, so the angle of deflection of the shaft is also rotating, or the drum which is used for compensate the deflection in the paper machine, the stationary shaft is curved.

In these work conditions, the bearing will generate additional sliding, considering the heat generated by friction of bearing, the angular error between the inner and outer ring should be less than 1 degree.

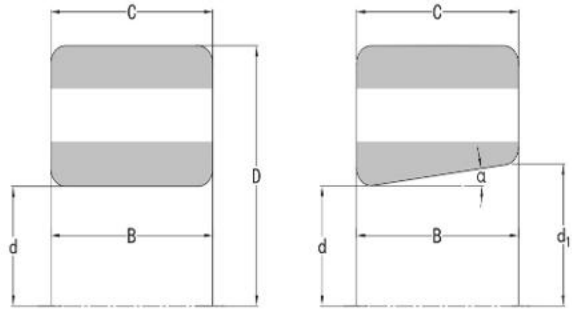
The sealed bearing allows the angle error between the shaft and the housing to be less than 0.5 degrees. The seals will not be damaged below this reference value.

Permissible misalignment error

Bearing series Size1)	Permissible angular error Degree	Bearing series Size	Allowed angular error Degree	Bearing series Size	Allowed angular error Degree
213 series	2	231 series Size<60	2	240 series	2
222 series Size<52	2	Size>64	3	241 series Size<64	2.5
Size>52	1.5	232 series Size<52	2.5	Size>64	3.5
223 series	3	Size>52	3.5	248 series	1.5
230 series Size<56	2	238 series	1.5	249 series	2.5
Size>56	2.5	239 series	1.5		

Tolerance

The QCB spherical roller bearings are manufactured according to P0 for normal applications, while P6 is applicable for higher precision application. On request, we can also supply bearings with P5 in accordance with GB/T307. The tolerance can be refered to talbe 1~8.



Parameter Symbols

B	Inner ring width
VBs	Variation of inner ring width
△Bs	Deviation of a single inner ring width
C	Outer ring width
VCs	Variation of outer ring width
△Cs	Deviation of a single outer ring width
d	Bore diameter
Vdmp	Variation of a single mean bore diameter (applicable only for cylindrical bore)
Vdsp	Variation of bore diameter in a single plane
△dmp	Deviation of mean bore diameter in a single plane,(△dmp refers only to the theoretical smaller end for tapered bore)
D	Outer diameter
VDmp	Variation of mean outer diameter
VDsp	Variation of outer diameter in a single plane
△Dmp	Deviation of mean outer diameter in a single plane
△Ds	Deviation of a single outer diameter
Kea	radial runout of assembled bearing outer ring
Kia	Radial runout of assembled bearing inner ring
Sd	Runout of the inner ring face to the bore
SD	Inclination deviation of the outer cylindrical surface to the outer ring end face
Sea	Axial runout of outer ring of assembled bearing
Sia	Axial runout of inner ring of assembled bearing

Tolerance

Radial Bearing Tolerance (Except for tapered roller bearings) Tolerance class P0 (Table1)

d(mm)		△dmp		Vdp Diameter series			Vdmp	△Bs		VBs	Kia
over	incl.	high	low	8,9 max	0,1 max	2,3,4 max	max	high	low	max	max
–	2.5	0	–8	10	8	6	6	0	–40	12	10
2.5	10	0	–8	10	8	6	6	0	–120	15	10
10	18	0	–8	10	8	6	6	0	–120	20	10
18	30	0	–10	13	10	8	8	0	–120	20	13
30	50	0	–12	15	12	9	9	0	–120	20	15
50	80	0	–15	19	19	11	11	0	–150	25	20
80	120	0	–20	25	25	15	15	0	–200	25	25
120	180	0	–25	31	31	19	19	0	–250	30	30
180	250	0	–30	38	38	23	23	0	–300	30	40
250	315	0	–35	44	44	26	26	0	–350	35	50
315	400	0	–40	50	50	30	30	0	–400	40	60
400	500	0	–45	56	56	34	34	0	–450	50	65
500	630	0	–50	63	63	38	38	0	–500	60	70
630	800	0	–75	–	–	–	–	0	–750	70	80
800	1,000	0	–100	–	–	–	–	0	–1,000	80	90
1,000	1,250	0	–125	–	–	–	–	0	–1,250	100	100
1,250	1,600	0	–160	–	–	–	–	0	–1,600	120	120
1,600	2,000	0	–200	–	–	–	–	0	–2,000	140	140

Radial Bearing Tolerance (Except for tapered roller bearings) Tolerance class P0 (Table2)

D(mm)		△Dmp		VDp Diameter series			Vdmp	△Cs		VBs	Kea
over	incl.	high	low	8,9 max	0,1 max	2,3,4 max	max	high	low	max	max
6	18	0	–8	10	8	6	6				15
18	30	0	–9	12	9	7	7				15
30	50	0	–11	14	11	8	8				20
50	80	0	–13	16	13	10	10				25
80	120	0	–15	19	19	11	11				35
120	150	0	–18	23	23	14	14				40
150	180	0	–25	31	31	19	19	△Cs and VCs values are			45
180	250	0	–30	38	38	23	23	identical to those for inner			50
250	315	0	–35	44	44	26	26	ring of same bearing(△Bs			60
315	400	0	–40	50	50	30	30	and VBs)			70
400	500	0	–45	56	56	34	34				80
500	630	0	–50	63	63	38	38				100
630	800	0	–75	94	94	55	55				120
800	1,000	0	–100	125	125	75	75				140
1,000	1,250	0	–125	–	–	–	–				160
1,250	1,600	0	–160	–	–	–	–				190
1,600	2,000	0	–200	–	–	–	–				220
2,000	2,500	0	–250	–	–	–	–				250

Tolerance

Radial Bearing Tolerance (Except for taper roller bearings) Tolerance class P6 (Table3)

d(mm)		△dmp		Vdp Diameter series			Vdmp	△Bs		VBs	Kia
over	incl.	high	low	8,9 max	0,1 max	2,3,4 max	max	high	low	max	max
–	2.5	0	–7	9	7	5	5	0	–40	12	5
2.5	10	0	–7	9	7	5	5	0	–120	15	6
10	18	0	–7	9	7	5	5	0	–120	20	7
18	30	0	–8	10	8	6	6	0	–120	20	8
30	50	0	–10	13	10	8	8	0	–120	20	10
50	80	0	–12	15	15	9	9	0	–150	25	13
80	120	0	–15	19	19	11	11	0	–200	25	18
120	180	0	–18	23	23	14	14	0	–250	30	20
180	250	0	–22	28	28	17	17	0	–300	30	25
250	315	0	–25	31	31	19	19	0	–350	35	30
315	400	0	–30	38	38	23	23	0	–400	40	35
400	500	0	–35	44	44	26	26	0	–450	45	40
500	630	0	–40	50	50	30	30	0	–500	50	45
630	800	0	–50	–	–	–	–	0	–750	55	50
800	1,000	0	–65	–	–	–	–	0	–1,000	60	60
1,000	1,250	0	–80	–	–	–	–	0	–1,250	70	70
1,250	1,600	0	–100	–	–	–	–	0	–1,600	70	80
1,600	2,000	0	–130	–	–	–	–	0	–2,000	80	

Radial Bearing Tolerance (Except for taper roller bearings) Tolerance class P6 (Table4)

D(mm)		△Dmp		VDp Diameter series			Vdmp	△Cs		Vcs	Kea
over	incl.	high	low	8,9 max	0,1 max	2,3,4 max	max	high	low	max	max
6	18	0	–7	9	7	5	5				8
18	30	0	–8	10	8	6	6				9
30	50	0	–9	11	9	7	7				10
50	80	0	–11	14	11	8	8				13
80	120	0	–13	16	16	10	10				18
120	150	0	–15	19	19	11	11				20
150	180	0	–18	23	23	14	14	△Cs and Vcs values are			23
180	250	0	–20	25	25	15	15	identical to those for inner			25
250	315	0	–25	31	31	19	19	ring of same bearing(△Bs			30
315	400	0	–28	35	35	21	21	and VBs)			35
400	500	0	–33	41	41	25	25				40
500	630	0	–38	48	48	29	29				50
630	800	0	–45	56	56	34	34				60
800	1,000	0	–60	75	75	45	45				75
1,000	1,250	0	–80	–	–	–	–				85
1,250	1,600	0	–100	–	–	–	–				100
1,600	2,000	0	–130	–	–	–	–				100
2,000	2,500	0	–160	–	–	–	–				120

Radial Bearing Tolerance (Except for taper roller bearings) Tolerance class P5 (Table5)

d(mm)		△dmp		Vdp Diameter series		Vdmp	△Bs		VBs	Kia	Sd
over	incl.	high	low	8,9 max	0,1,2,3,4 max	max	high	low	max	max	max
–	2.5	0	–5	5	4	3	0	–40	5	4	7
2.5	10	0	–5	5	4	3	0	–40	5	4	7
10	18	0	–5	5	4	3	0	–80	5	4	7
18	30	0	–6	6	5	3	0	–120	5	4	8
30	50	0	–8	8	6	4	0	–120	5	5	8
50	80	0	–9	9	7	5	0	–150	6	5	8
80	120	0	–10	10	8	5	0	–200	7	6	9
120	180	0	–13	13	10	7	0	–250	8	8	10
180	250	0	–15	15	12	8	0	–300	10	10	11
250	315	0	–18	18	14	9	0	–350	13	13	13
315	400	0	–23	23	18	12	0	–400	15	15	15
400	500	0	–27	28	21	14	0	–450	18	17	18
500	630	0	–33	35	26	18	0	–500	20	19	20
630	800	0	–40	–	–	–	0	–750	26	22	26
800	1,000	0	–50	–	–	–	0	–1,000	32	26	32
1,000	1,250	0	65	–	–	–	0	–1,250	38	30	38
1,250	1,600	0	–80	–	–	–	0	–1,600	45	35	45
1,600	2,000	0	–100	–	–	–	0	–2,000	55	40	55

Radial Bearing Tolerance (Except for taper roller bearings) Tolerance class P5 (Table6)

D(mm)		△Dmp		VDp Diameter series		VDmp	△Cs		Vcs	Kea	SD
over	incl.	high	low	8,9 max	0,1,2,3,4 max	max	high	low	max	max	max
6	18	0	–5	5	4	3			5	5	8
18	30	0	–6	6	5	3			5	6	8
30	50	0	–7	7	5	4			5	7	8
50	80	0	–9	9	7	5			6	8	8
80	120	0	–10	10	8	5			8	10	9
120	150	0	–11	11	8	6			8	11	10
150	180	0	–13	13	10	7	△Cs values are		8	13	10
180	250	0	–15	15	11	8	identical to		10	15	11
250	315	0	–18	18	14	9	those for inner		11	18	13
315	400	0	–20	20	15	10	ring of same		13	20	13
400	500	0	–23	23	17	12	bearing(△Bs)		15	23	15
500	630	0	–28	28	21	14			18	25	18
630	800	0	–35	35	26	18			20	30	20
800	1,000	0	–40	50	29	25			25	35	25
1,000	1,250	0	–50	–	–	–			30	40	30
1,250	1,600	0	–65	–	–	–			35	45	35
1,600	2,000	0	–85	–	–	–			38	55	40
2,000	2,500	0	–110	–	–	–			45	65	50

Tolerance

Tolerances for tapered bores, taper 1:12 (μ m) (Table7)

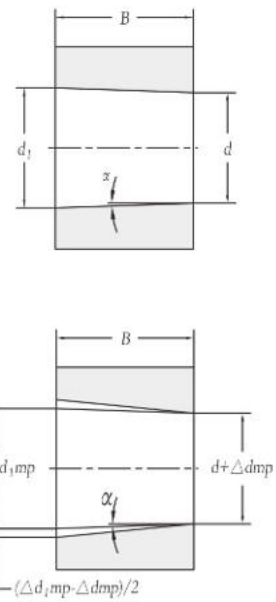
d(mm)		Normal class Po and P6					Class P5				
		△dmp		Vdp[1)]	△d1mp−△dmp		△dmp		Vdp[1)]	△d1mp−△dmp	
over	incl.	high	low	max	high	low	high	low	max	high	low
18	30	+21	0	13	+21	0	+13	0	13	+13	0
30	50	+25	0	15	+25	0	+16	0	15	+16	0
50	80	+30	0	19	+30	0	+19	0	19	+19	0
80	120	+35	0	25	+35	0	+22	0	22	+22	0
120	180	+40	0	31	+40	0	+25	0	25	+25	0
180	250	+46	0	38	+46	0	+29	0	29	+29	0
250	315	+52	0	44	+52	0	+32	0	32	+32	0
315	400	+57	0	50	+57	0	+36	0	36	+36	0
400	500	+63	0	56	+63	0	+40	0	–	+40	0
500	630	+70	0	70	+70	0	+44	0	–	+44	0
630	800	+80	0	–	+80	0	+50	0	–	+50	0
800	1,000	+90	0	–	+90	0	+56	0	–	+56	0
1,000	1,250	+105	0	–	+105	0	+66	0	–	+66	0
1,250	1,600	+125	0	–	+125	0	+78	0	–	+78	0
1,600	2,000	+150	0	–	+150	0	+92	0	–	+92	0

* Remark: [1)]Valid in any radial cross-section of the bore

Tolerances for tapered bores, taper 1:30 (μ m) (Table8)

d (mm)		Normal Class P0				
		△dmp		Vdp[1)]	△d1mp−△dmp	
over	incl.	high	low	max	high	low
–	80	+15	0	19	+30	0
80	120	+20	0	22	+35	0
120	180	+25	0	40	+40	0
180	250	+30	0	46	+46	0
250	315	+35	0	52	+52	0
315	400	+40	0	57	+57	0
400	500	+45	0	63	+63	0
500	630	+50	0	70	+70	0
630	800	+75	0	–	+100	0
800	1,000	+100	0	–	+100	0
1,000	1,250	+125	0	–	+115	0
1,250	1,600	+160	0	–	+125	0
1,600	2,000	+200	0	–	+150	0

* Remark: [1)]Valid in any radial cross-section of the bore



Taper 1:12
Half of taper angle α =2° 23′ 9.4 ″;
Theoretical large end diameter

$d1=d+\frac{1}{12}\times B$

Taper 1:30
Half of taper angle=0°57′ 17.4 ″;
Theoretical large end diameter

$d1=d+\frac{1}{30}\times B$

Clearance

The QCB spherical roller bearings are usually supplied with C3 clearance class, other requirements, C2, C4 or C5 can be supplied on request. Bearings for vibratory application have C4 clearance. The radial clearance can be refered to table 9~10

Radial internal clearance for spherical roller bearings with tapered bore (Table9) μm

Bore diameter d(mm)		Radial internal clearance									
		C2		C0		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
14	18	10	20	20	35	35	45	45	60	60	75
18	24	10	20	20	35	35	45	45	60	60	75
24	30	15	25	25	40	40	55	55	75	75	95
30	40	15	30	30	45	45	60	60	80	80	100
40	50	20	35	35	55	55	75	75	100	100	125
50	65	20	40	40	65	65	90	90	120	120	150
65	80	30	50	50	80	80	110	110	145	145	180
80	110	35	60	60	100	100	135	135	180	180	225
100	120	40	75	75	120	120	160	160	210	210	260
120	140	50	95	95	145	145	190	190	240	240	300
140	160	60	110	110	170	170	220	220	280	280	350
160	180	65	120	120	180	180	240	240	310	310	390
180	200	70	130	130	200	200	260	260	340	340	430
200	225	80	140	140	220	220	290	290	380	380	470
225	250	90	150	150	240	240	320	320	420	420	520
250	280	100	170	170	260	260	350	350	460	460	570
280	315	110	190	190	280	280	370	370	500	500	630
315	355	120	200	200	310	310	410	410	550	550	690
355	400	130	220	220	340	340	450	450	600	600	750
400	450	140	240	240	370	370	500	500	660	660	820
450	500	140	260	260	410	410	550	550	720	720	900
500	560	150	280	280	440	440	600	600	780	780	1000
560	630	170	310	310	480	480	650	650	850	850	1100
630	710	190	350	350	530	530	700	700	920	920	1190
710	800	210	390	390	580	580	770	770	1010	1010	1300
800	900	230	430	430	650	650	860	860	1120	1120	1440
900	1000	260	480	480	710	710	930	930	1220	1220	1570
1000	1120	290	530	530	780	780	1020	1020	1330	1330	1720
1120	1250	320	580	580	860	860	1120	1120	1460	1460	1870
1250	1400	350	640	640	950	950	1240	1240	1620	1620	2060
1400	1600	400	720	720	1060	1060	1380	1380	1800	1800	2300
1600	1800	450	810	810	1180	1180	1550	1550	2000	2000	2550

Clearance

Radial internal clearance for spherical roller bearings with tapered bore (Table10) μm

Bore diameter d(mm)		Radial internal clearance									
		C2		C0		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
18	24	15	25	25	35	35	45	45	60	60	75
24	30	20	30	30	40	40	55	55	75	75	95
30	40	25	35	35	50	50	65	65	85	85	105
40	50	30	45	45	60	60	80	80	100	100	130
50	65	40	55	55	75	75	95	95	120	120	160
65	80	50	70	70	95	95	120	120	150	150	200
80	110	55	80	80	110	110	140	140	180	180	230
100	120	65	100	100	135	135	170	170	220	220	280
120	140	80	120	120	160	160	200	200	260	260	330
140	160	90	130	130	180	180	230	230	300	300	380
160	180	100	140	140	200	200	260	260	340	340	430
180	200	110	160	160	220	220	290	290	370	370	470
200	225	120	180	180	250	250	320	320	410	410	520
225	250	140	200	200	270	270	350	350	450	450	570
250	280	150	220	220	300	300	390	390	490	490	620
280	315	170	240	240	330	330	430	430	540	540	680
315	355	190	270	270	360	360	470	470	590	590	740
355	400	210	300	300	400	400	520	520	650	650	820
400	450	230	330	330	440	440	570	570	720	720	910
450	500	260	370	370	490	490	630	630	790	790	1000
500	560	290	410	410	540	540	680	680	870	870	1100
560	630	320	460	460	600	600	760	760	980	980	1230
630	710	350	510	510	670	670	850	850	1090	1090	1360
710	800	390	570	570	750	750	960	960	1220	1220	1500
800	900	440	640	640	840	840	1070	1070	1370	1370	1690
900	1000	490	710	710	930	930	1190	1190	1520	1520	1860
1000	1120	530	770	770	1030	1030	1300	1300	1670	1670	2050
1120	1250	570	830	830	1120	1120	1420	1420	1830	1830	2250
1250	1400	620	910	910	1230	1230	1560	1560	2000	2000	2450
1400	1600	680	1000	1000	1350	1350	1720	1720	2200	2200	2700
1600	1800	750	1110	1110	1500	1500	1920	1920	2400	2400	2950

The Minimum Load

Spherical roller bearings, same as all ball bearings and roller bearings, must be designed to bear a minimum load for sound performance, especially at high speed for high acceleration, or rapid changes in load direction. In these conditions, the inertia of roller and the cage, and the friction in the lubricant will adversely affect the rolling of the bearing, which may cause a damaging sliding motion between the roller and the raceway.

The minimum load of spherical roller bearings can be estimated with the following formula

$$Frmin=0.01Cor$$

In which

Frmin=Minimum equivalent static load, KN

Cor=Basic rating static load, KN

In case of low temperature star-up or the viscosity of the lubricant is high, a higher minimum load may be required, even higher than Frmin=0.01Cor. The weight of the bearing supported and the external force usually exceeds the required minimum load. If the minimum load has not been reached, the self-aligning roller bearing must be subjected to an additional radial load.

Radial Equivalent Load

The radial equivalent dynamic load of spherical roller bearings in a constant radial and axial load is :

$P=Fr+Y1Fa$ when $Fa/Fr \leq e$

$P=0.67Fr+Y2Fa$ when $Fa/Fr>e$

Value of e, Y1 and Y2 are listed in product table

The radial equivalent static load of spherical roller bearings

$$P=Fr+Y0Fa$$

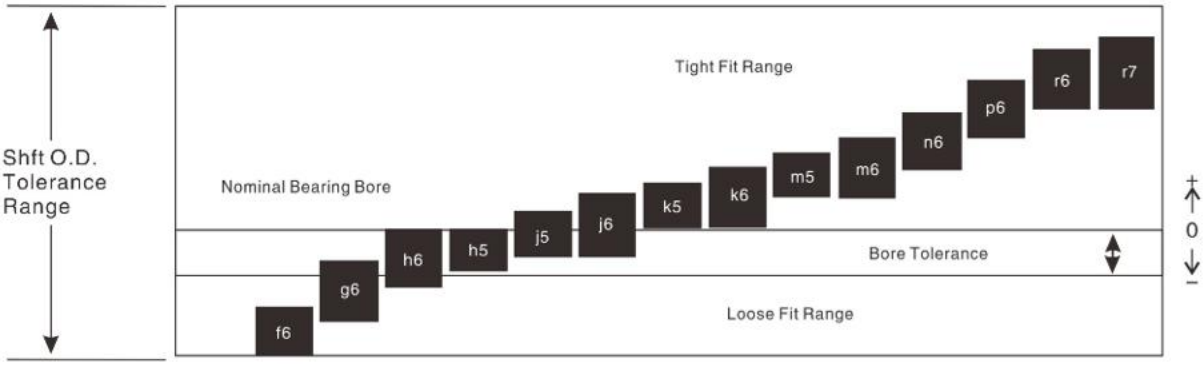
Value of Y0 is listed in product table.

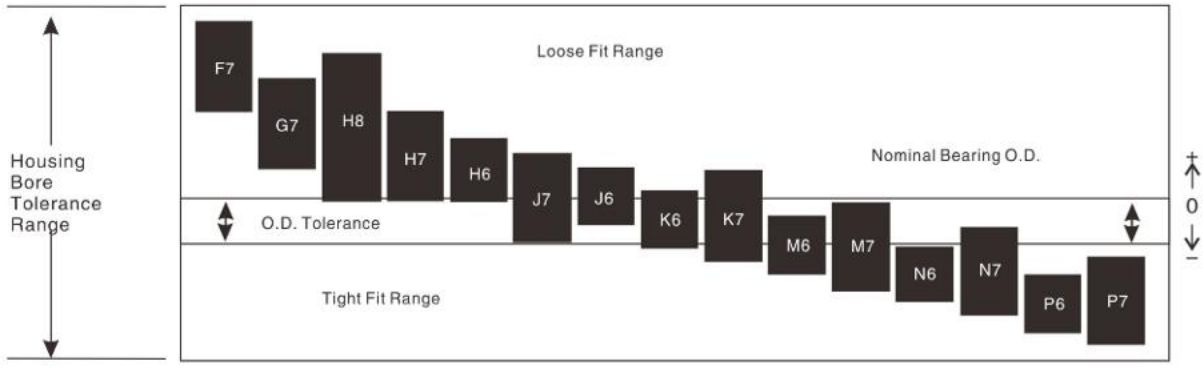
Coordination

Shaft and Housing Coordination

Radial Ball Bearings, Spherical Roller Bearings, Cylindrical Roller Bearings

The fit standard between bearing and shaft, housing is comply with ISO standards, its tolerance range please refer to the figure below. The bar designated by g6, h6 etc. represent shaft/housing diameter and tolerance ranges to achieve various loose and interference fits required for various load and ring rotation conditions.





Bore and Shaft Coordination

Radial Ball Bearings, Spherical Roller Bearings, Cylindrical Roller Bearings

The deviation of the bore diameter and shaft diameter (relative to nominal bore diameter) refer to the below table. The column of fits shows the possible value of the tightest and the loosest, "L" stands for loose or clearances, and "T" for tight or interference.

Bearing bore diameter		f6			g6			h6		
Nominal Dimension		Tolerance △dmp	Shaft dia.	Fit	Shaft dia.	Fit		Shaft dia.	Fit	
Over	Incl	Upper Lower	Min. Max.		Min. Max.			Min. Max.		
mm		μm	μm		μm			μm		
3	6	0 −8	−10 −18	18L 2L	−4 −12	12L 4T		0 −8	8L 8T	
6	10	0 −8	−13 −22	22L 5L	−5 −14	14L 3T		0 −9	9L 8T	
10	18	0 −8	−16 −27	27L 8L	−6 −17	17L 2T		0 −11	11L 8T	
18	30	0 −10	−20 −33	33L 10L	−7 −20	20L 3T		0 −13	13L 10T	
30	50	0 −12	−25 −41	41L 13L	−9 −25	25L 3T		0 −16	16L 12T	
50	60	0 −15	−30 −49	49L 15L	−10 −29	29L 5T		0 −19	19L 15T	
80	120	0 −20	−36 −58	58L 16L	−12 −34	34L 8T		0 −22	22L 20T	
120	180	0 −25	−43 −68	68L 18L	−14 −39	39L 11T		0 −25	25L 25T	
180	200	0 −30	−50 −79	79L 20L	−15 −44	44L 15T		0 −29	29L 30T	
200	225	0 −30	−50 −79	79L 20L	−15 −44	44L 15T		0 −29	29L 30T	
225	250	0 −30	−50 −79	79L 20L	−15 −44	44L 15T		0 −29	29L 30T	
250	280	0 −35	−56 −88	88L 21L	−17 −49	49L 18T		0 −32	32L 35T	
280	315	0 −35	−56 −88	88L 21L	−17 −49	49L 18T		0 −32	32L 35T	

Bore and Shaft Coordination



Refer to pages 13 to 14 please find recommended coordination for spherical roller bearings under specific operating conditions.

h5			j5			j6			k5		
Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit
Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.	
μm			μm			μm			μm		
0	−5	5L 8T	+3	−2	2L 11T	+6	−2	2L 14T	+6	+1	1T 14T
0	−6	6L 8T	+4	−2	2L 12T	+7	−2	2L 15T	+7	+1	1T 15T
0	−8	8L 8T	+5	−3	3L 13T	+8	−3	3L 16T	+8	+1	1T 17T
0	−9	9L 10T	+5	−4	4L 15T	+9	−4	4L 19T	+11	+2	2T 21T
0	−11	11L 12T	+6	−5	5L 18T	+11	−5	5L 23T	+13	+2	2T 25T
0	−13	13L 15T	+6	−7	7L 21T	+12	−7	7L 27T	+15	+2	2T 30T
0	−15	15L 20T	+6	−9	9L 16T	+13	−9	9L 33T	+18	+3	3T 38T
0	−18	18L 25T	+7	−11	11L 32T	+14	−11	11L 39T	+21	+3	3T 46T
0	−18	18L 25T	+7	−13	13L 37T	+16	−13	13L 46T	+24	+4	4T 54T
0	−20	20L 30T	+7	−13	16L 37T	+16	−13	13L 46T	+24	+4	4T 54T
0	−20	20L 30T	+7	−13	13L 37T	+16	−13	13L 46T	+24	+4	4T 54T
0	−23	23L 35T	+7	−16	16L 42T	+16	−16	16L 51T	+27	+4	4T 62T
0	−23	23L 35T	+7	−16	16L 42T	+16	−16	16L 51T	+27	+4	4T 62T

Bore and Shaft Coordination

Radial Ball Bearings, Spherical Roller Bearings, Cylindrical Roller Bearings

The deviation of the bore diameter and shaft diameter (relative to nominal bore diameter) refer to the below table. The column of fits shows the possible value of the tightest and the loosest, "L" stands for loose or clearances, and "T" for tight or interference.

Bearing bore diameter				k6			m5			m6		
Nominal Dimension		Tolerance △dmp		Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit
Over	Incl	Upper	Lower	Min.	Max.		Min.	Max.		Min.	Max.	
mm		μm		μm			μm			μm		
3	6	0	−8				+9	+4	4T 17T			
6	10	0	−8				+12	+6	6T 20T			
10	18	0	−8				+15	+7	7T 23T			
18	30	0	−10				+17	+8	8T 27T			
30	50	0	−12	+18	+2	2 30	+20	+9	9T 32T	+25	+9	9T 37T
50	60	0	−15	+21	+2	2 36	+24	+11	11T 39T	+30	+11	11T 45T
80	120	0	−20	+25	+3	3 45	+28	+13	13T 48T	+35	+13	13T 55T
120	180	0	−25	+28	+3	3 53	+33	+15	15T 58T	+40	+15	15T 65T
180	200	0	−30				+37	+17	17T 67T	+46	+17	17T 76T
200	225	0	−30				+37	+17	17T 67T	+46	+17	17T 76T
225	250	0	−30				+37	+17	17T 67T	+46	+17	17T 76T
250	280	0	−35				+43	+20	20T 78T	+52	+20	20T 87T
280	315	0	−35				+43	+20	20T 78T	+52	+20	20T 87T

Bore and Shaft Coordination



Refer to pages 15 to 16 please find recommended coordination for spherical roller bearings under specific operating conditions.

n61			p6			r6			r7		
Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit
Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.	
μm			μm			μm			μm		
+39	+20	20T 54T									
+45	+23	23T 65T	+59	+37	37T 79T						
+52	+27	27T 77T	+68	+43	43T 93T	+90	+65	65T 115T			
+60	+31	31T 90T	+79	+50	50T 109T	+106	+77	77T 136T			
+60	+31	31T 90T	+79	+50	50T 109T	+109	+80	80T 139T	+126	+80	80T 156T
+60	+31	31T 90T	+79	+50	50T 109T	+113	+84	84T 143T	+130	+84	84T 160T
+66	+34	34T 101T	+88	+56	56T 123T	+126	+94	94T 161T	+146	+94	94T 181T
+66	+34	34T 101T	+88	+561	56T 123T	+130	+98	98T 165T	+150	+98	98T 185T

Bore and housing Coodination

Radial Ball Bearings, Spherical Roller Bearings, Cylindrical Roller Bearings

The deviation of bearing outer diameter and housing (relative to nominal outer diameter) refer to the below table. The column of fits shows the possible value of the tightest and the loosest, "L" stands for loose or clearances, and "T" for tight or interference.

Bearing bore diameter		F7			G7			H8		
Nominal Dimension		Tolerance △dmp	Shaft dia.	Fit	Shaft dia.	Fit		Shaft dia.	Fit	
Over	Incl	Upper Lower	Min. Max.		Min. Max.			Min. Max.		
mm		μm	μm		μm			μm		
10	18	0 −8	+16 +34	16L 42L	+6 +24	6L 32L		0 +27	0L 35L	
18	30	0 −9	+20 +41	20L 50L	+7 +28	7L 37L		0 +33	0L 42L	
30	50	0 −11	+25 +50	25L 61L	+9 +34	9L 45L		0 +39	0L 50L	
50	80	0 −13	+30 +60	30L 73L	+10 +40	10L 53L		0 +46	0L 59L	
80	120	0 −15	+36 +71	36L 86L	+12 +47	12L 62L		0 +54	0L 69L	
120	150	0 −18	+43 +83	43L 101L	+14 +54	14L 72L		0 +63	0L 81L	
150	180	0 −25	+43 +83	43L 108L	+14 +54	14L 79L		0 +63	0L 88L	
180	250	0 −30	+50 +96	50L 126L	+15 +61	15L 91L		0 +72	0L 102L	
250	315	0 −35	+56 +108	56L 143L	+17 +69	17L 104L		0 +81	0L 116L	
315	400	0 −40	+62 +119	62L 159L	+18 +75	18L 115L		0 +89	0L 129L	
400	500	0 −45	+68 +131	68L 176L	+20 +83	20L 128L		0 +97	0L 142L	
500	630	0 −50	+76 +146	76L 196L	+22 +92	22L 142L		0 +110	0L 160L	
630	800	0 −75	+80 +160	80L 235L	+24 +104	24L 179L		0 +125	0L 200L	

Bore and housing Coodination



Refer to pages 17 to 18 please find recommended coordination for spherical roller bearings under specific operating conditions.

H7			H6			J6			J7		
Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit
Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.	
μm			μm			μm			μm		
0	+18	0L 23L	0	+11	0L 19L	−5	+6	5T 14L	−8	+10	8T 18L
0	+21	0L 30L	0	+13	0L 22L	−5	+8	5T 17L	−9	+12	9T 21L
0	+25	0L 36L	0	+16	0L 27L	−6	+10	6T 21L	−11	+14	11T 25L
0	+30	0L 43L	0	+19	0L 32L	−6	+13	6T 26L	−12	+18	12T 31L
0	+35	0L 50L	0	+22	0L 37L	−6	+16	6T 31L	−13	+22	13T 37L
0	+40	0L 58L	0	+25	0L 43L	−7	+18	7T 36L	−14	+26	14T 44L
0	+40	0L 65L	0	+25	0L 50L	−7	+18	7T 43L	−14	+26	14T 51L
0	+46	0L 76L	0	+29	0L 59L	−7	+22	7T 52L	−16	+30	16T 60L
0	+52	0L 87L	0	+32	0L 67L	−7	+25	7T 60L	−16	+36	16T 71L
0	+57	0L 97L	0	+36	0L 76L	−7	+29	7T 69L	−19	+39	18T 79L
0	+63	0L 108L	0	+40	0L 85L	−7	+33	7T 78L	−20	+43	20T 88L
0	+70	0L 120L	0	+44	0L 94L	−7	+37	7T 87L	−22	+48	22T 98L
0	+80	0L 155L	0	+50	0L 120L	−10	+40	10T 115L	−24	+56	24T 131L

Bore and housing Coodination

Radial Ball Bearings, Spherical Roller Bearings, Cylindrical Roller Bearings

The deviation of bearing outer diameter and housing (relative to nominal outer diameter) refer to the below table. The column of fits shows the possible value of the tightest and the loosest, "L" stands for loose or clearances, and "T" for tight or interference.

Bearing bore diameter		K6				K7				M6			
Nominal Dimension		Tolerance △dmp		Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit	
Over	Incl	Upper	Lower	Min.	Max.		Min.	Max.		Min.	Max.		
mm		μm		μm			μm			μm			
10	18	0	−8	−9	+2	9T 10L	−12	+6	12T 14L	−15	−4	15T 4L
18	30	0	−8	−11	+2	11T 11L	−15	+6	15T 15L	−17	−4	17T 5L
30	60	0	−11	−13	+3	13T 14L	−18	+7	18T 18L	−20	−4	20T 7L
50	50	0	−13	−15	+4	15T 17L	−21	+9	21T 22L	−24	−5	24T 8L
80	120	0	−15	−18	+4	18T 19L	−25	+10	25T 25L	−28	−6	28T 9L
120	150	0	−18	−21	+4	21T 22L	−28	+12	28T 30L	−33	−8	33T 10L
150	180	0	−25	−21	+4	21T 29L	−28	+12	28T 37L	−33	−8	33T 17L
180	250	0	−30	−24	+5	24T 35L	−33	+13	33T 43L	−37	−8	37T 22L
250	315	0	−35	−27	+5	27T 40L	−36	+16	36T 51L	−41	−9	41T 26L
315	400	0	−40	−29	+7	29T 47L	−40	+17	40T 57L	−46	−10	46T 30L
400	500	0	−45	−32	+8	32T 53L	−45	+18	45T 63L	−50	−10	50T 35L
500	630	0	−50	−44	0	44T 50L	−70	0	70T 50L	−70	−26	70T 24L
630	800	0	−75	−50	0	50T 75L	−80	0	80T 75L	−80	−30	80T 45L

Bore and housing Coodination



Refer to pages 19 to 20 please find recommended coordination for spherical roller bearings under specific operating conditions.

M7			N6			N7			P6			P7		
Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit	Shaft dia.		Fit
Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.	
μm			μm			μm			μm			μm		
−18	0	18T 8L	−20	−9	20T 1T	−23	−5	23T 3L	−26	−15	26T 7T	−29	−11	29T 3T
−21	0	21T 9L	−24	−11	24T 2T	−28	−7	28T 2L	−31	−18	31T 9T	−35	−14	35T 5T
−25	0	25T 11L	−28	−12	28T 1T	−33	−8	33T 3L	−37	−21	37T 10T	−42	−17	42T 6T
−30	0	30T 13L	−33	−14	33T 1T	−39	−9	39T 4L	−45	−26	45T 13T	−51	−21	51T 8T
−35	0	35T 15L	−38	−16	38T 1T	−45	−10	45T 5L	−52	−30	52T 15T	−59	−24	59T 9T
−40	0	40T 18L	−45	−20	45T 2T	−52	−12	52T 6L	−61	−36	61T 18T	−68	−28	68T 10T
−40	0	40T 25L	−45	−20	45T 5T	−52	−12	52T 13L	−61	−36	61T 11T	−68	−28	68T 3T
−46	0	46T 30L	−51	−22	51T 8T	−60	−14	60T 16L	−70	−41	70T 11T	−79	−33	79T 3T
−52	0	52T 35L	−57	−25	57T 10T	−66	−14	66T 21L	−79	−47	79T 12T	−88	−36	88T 1T
−57	0	57T 40L	−62	−26	62T 14T	−73	−16	3T 24L	−87	−51	87T 11T	−98	−41	98T 1T
−63	0	63T 45L	−67	−27	67T 18T	−80	−17	80T 28L	−95	−55	95T 10T	−108	−45	108T 0T
−96	0	96T 24L	−88	−44	88T 6T	−114	−44	114T 6L	−122	−78	122T 28T	−148	−78	148T 28T
−110	0	110T 45L	−100	−50	100T 25T	−130	−50	130T 25L	−138	−88	138T 13T	−168	−88	168T 13T

Bore and housing Coodination

The table 11 below lists the mating of the shaft as recommended for specific operating conditions

Shaft

Table 11

	Conditions	Operational Example	Shaft Diameter	Tolerance Symbol	Remark
Cylindrical bore					
Static inner ring load	The inner ring on the shaft which is easy to displace	Two-bearings spindle structure	All diameters	f6	
		The wheels on the stationary spindle		g6	
	The inner ring is not necessary to displace	Tension wheel and pulleys		h6	
Rotating inner ring load or load direction can not be judged	Light load and variable load P≤0.07Cr	Electrical appliances, machine tools, pumps, ventilation fans, industrial trucks	Over Incl. 18 100 100 200	k6 m6	k5, m5 are used instead of k6, m6 in highly accurate situation.
	General load and heavy load P≥0.07Cr P≤0.25Cr	Applicable general machinery, motors, turbines, pumps, internal combustion engines, gear drives, woodworking machinery	18 65 65 100 100 140 140 280 280 500 500 —	m5 m6 n6 p6 r6 r7	
	Heavy load and impact load P>0.25Cr	Journal boxes and traction motors for locomotives and other railway heavy vehicles	All diameters	m6 n6 p6 r6 r7	Larger than general clearance
Bearings with tapered bore and adapter sleeve					
	All loads	General situation	All diameters		See radial internal clearance reduction

Bore and housing Coodination

The table12 lists the mating of the housing as recommended for specific operating conditions

Housing

Table 12

Condition			Operational Example		Tolerance symbol	Remark
General housing	Rotating outer ring load	Variable load direction	Double bearing eccentric shaft structure		P6	Outer ring could not be displaced axially
		Thin-walled housing, heavy-load bearings	Crane bearing wheel hub, crank bearing		P7	
		General and variable	Hub, crank bearing		N7	
		Light and variable load	Conveying roller, pulley, tension wheel		M7	
	Uncertained load direction	Heavy impact load	Traction motor			
Separate or integral housing		Heavy load, general, outer ring is not necessary axial displaced	Motor, pump, main bearing of crankshaft		K7	The outer ring serves as the fixed end of the axis
		Heavy load, light load, axial replacement of the outer ring is required	Motor, pump, crankshaft main bearing		J7	The outer ring acts as the floating end of the axis
	Static outer ring load	Impact load, temporarily idling completely	Journal box for trucks			
		All loads	General purpose, train journal box		H7	The outer ring can be easily displaced axially
		General or light load, load of single operation state	Driven shaft strip		H8	
		Heating through the shaft	Dryer		G7	
General housing	Special precision required	The deformation is small when operating accurately with different loads	For machine tool spindles	Outer diameter<125 mm	M6	The outer ring cannot be easily displaced axially
				125mm<outer diameter<250 mm	N6	
				Outer diameter>250 mm	P6	
		Operating precisely with light load or uncertained direction	Locating bearings in high-speed centrifugal compressors		K6	The outer ring can be displaced axially
		Outer ring will take axial displacement in accurate operation	Bearings at floated end in high speed centrifugal compressors		J6	The outer ring can be easily displaced axially

Bearing Mounting and Dismounting

Bearing Mounting and Dismounting

Mounting
Straight Bore Bearing Instalation

Thermodilatometry
In most occasions, the bearings require an interference fit on the shaft. The bearing is heated so that it is sufficiently expanded so as to be easily slide onto the shaft, thus the installation is very simple. Here are two common heating methods

1) Oil tank heating
2) Induction heating

The first method is to heating the bearing in a tank filled with high ignition oil. The oil temperature should not exceed 121℃. For most applications, 93℃ is sufficient, and the bearing is usually heated in 20 or 30 minutes in the oil, which allows it to expand sufficiently and easy to fit the shaft.

Induction heating method is particularly applicable to the installation of small bearings, this method is fast, but must be careful, the temperature can not exceed 93℃. It is necessary to obtain the correct time by trial operation. The bearing temperature can be measured by using a thermoelectric crayon that melts at a predetermined temperature

To make the bear perpendicular to the shoulder when the bearing is still hot, and then use the lock washer, lock nut or clamping plate to fixed. After the bearing cool down, tighten the lock nut or clamp In case of the outer ring is fitted closely with the housing hole when the outer ring is rotating, the housing can be heated at this time

Bearings can not be directly contact with the heat source, generally a stencil is placed 5cm away from the bottom, and with a small support block to separate the bearing and the stencil. It is important to separate the bearing from the heat source with high localized temperature. Otherwise, the bearing temperature will be too high to reduce its hardness

Flame burners are common heaters which require an automatic temperature control. If the safety rule does not permit to use open heating sumps, mix 15% soluble oil in water, but this mixture can be heated up to 93℃ without generating flame. The oil sump must always be checked if use this kind of method, to make sure whether the water–oil mixing is appropriate. This oil bath leaves a thin film of oil on the Surface of the bearing that temporary anti–rust, it should be lubricated as soon as possible after installation, and ensure that soluble oil in bearings is clean up.

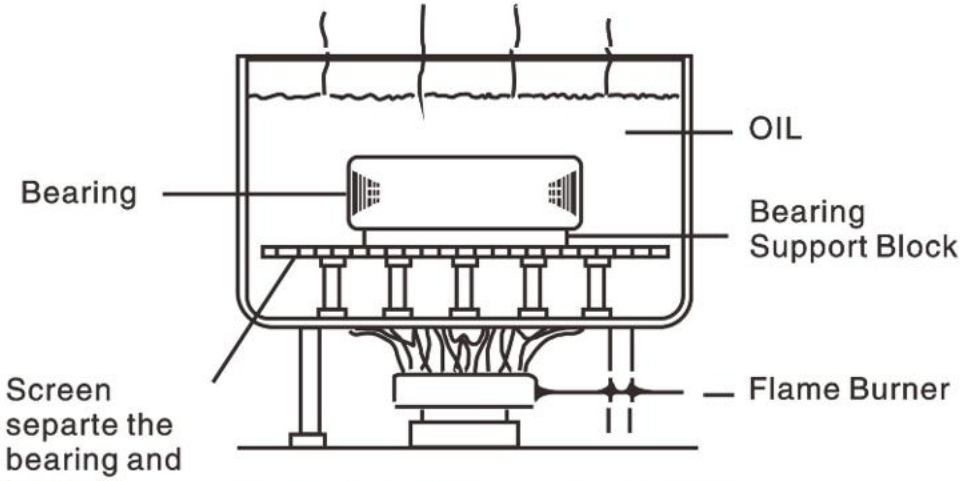


Figure 2: Heat Expansion Method

Fig.1

Mandrel pressure method

Mandrel pressure method

Another solution for small size bearing is to use a mandrel press and mounting tube as shown in Figure 2 to press the bearing against the shaft or into the housing. The mounting sleeve can be made of mild steel. The inner diameter should be slightly larger than the main bearing, the outer diameter should be not exceed the maximum shoulder listed in the table. The tow ends of the sleeve should be perpendicular to the mandrel and bearing bore. The inside and outside should be clean and have sufficient length to ensure the shaft ends will not be exposed after installed.

If the outer ring is pressed into the housing bore, the outer diameter of the mounting tube shall be slightly smaller than the outer housing bore and shall not be less than the diameter of the specified bearing housing shoulder, as shown in Fig.3

If the bearing rings are tightly fitted to the shaft and the housing bore, a customized mounting sleeve is used to press the bearing against the shaft and housing bore, as shown in Fig.4

Apply a little light oil on the bearing to reduce the force required to press fit. Place the bearing carefully on the shaft so that it is perpendicular to the spindle axis.

Do not apply pressure to the outer ring when the bearing is tightly fitted to the shaft, or apply pressure to the inner ring when the bearing is in tight fit with the outer ring.

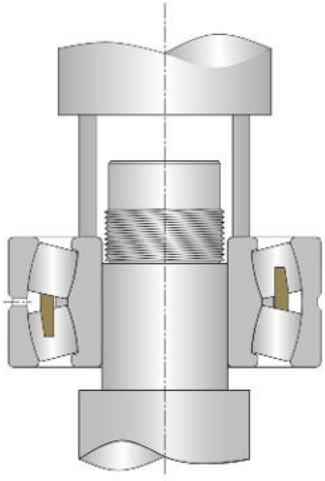


Fig.2

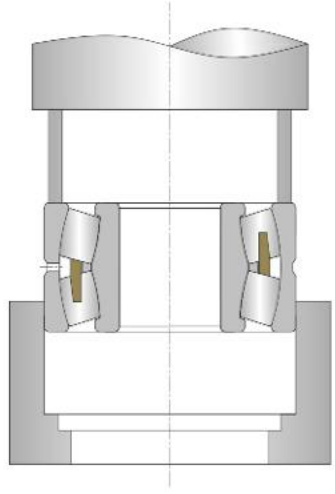


Fig.3

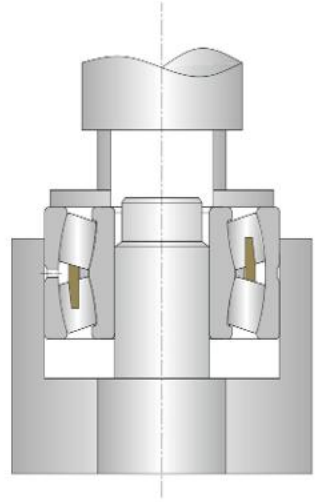


Fig.4

Installation of Tapered Bore Spherical Roller Bearings on Shafts

Although we can define the fit of tapered bore spherical roller bearings by measuring the distance of bearing mounted to the tapered shaft, but more practical method is to measure radial clearance that is reduced by the force due to the expansion of the inner ring. The initial radial clearance prior to installation should be defined, and measuring continuously during installation until reduced to the appropriate radial clearance. The following procedure can be used in order to define the initial radial clearance. Use a feeler gauge as thin as 0.04mm. Firstly holding bearing up, so that the inner and outer ring end face parallel Pressing the inner ring by thumb and swing 2 to 3 times, press down firmly, so that the inner ring and the rolling element will

Mandrel pressure method

be seated in position as shown in Figure 5. Positioning each roller so that there is a roller on either side of the top of the inner ring raceway, and push the top two rollers inward to ensure proper contact with the inner ring raceway. When the roller is in the correct position, insert a thin feeler rollers along the top move slowly in the raceway between rollers and the outer ring, as shown in Figure 6; and then put on a thicker feeler to repeat, untill it is thick enough and can not move. The maximum thickness that can pass through the feeler is the radial clearance before installation.

inner ring reaches the interference fit. The radial clearance is measured periodically to obtain its reduction and this is repeated until a suitable reduction is achieved (not to exceed the recommended reduction). For the last inspection, ensure that the radial clearance is equal to or more than the minimum assembly clearance shown in the table

The radial clearance of the unloaded roller should be checked when assembling. If the unloaded roller is at the bottom, ensure that the roller is lifted and seated securely in the

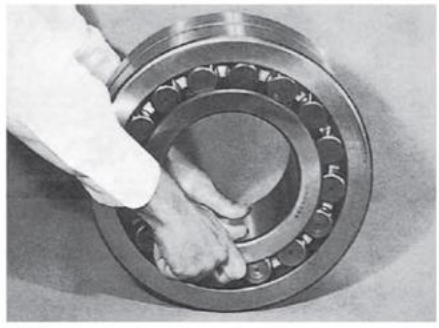


Fig.5

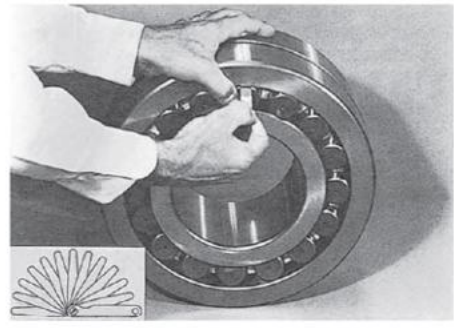


Fig.6

Then use the method described in the former example to define the target value of radial clearance reduction. Sliding the bearing as deep as possible to the spindle (Figure 7) or through the adapter sleeve (Figure 8) when assembly. The withdrawal sleeve (shown in Figure 9) is assembled on the shaft. When the locking nut is tightened, the expansion of the inner ring raceway.

The bearings are properly fitted when reached the recommended radial clearance. Then, insert the lock washer teeth into the groove of the lock nut or tighten clamp

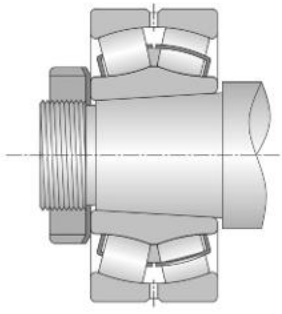


Fig.7

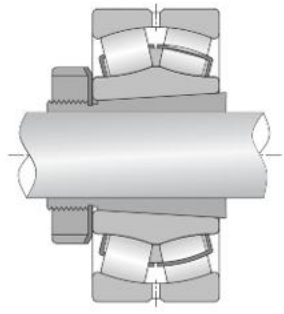


Fig.8

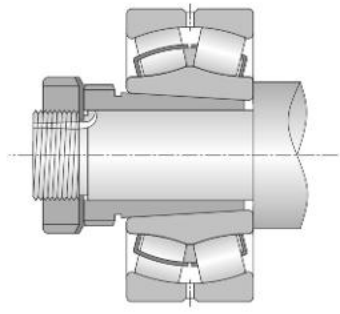


Fig.9

Mandrel pressure method

The following table 13 shows the recommended radial clearance for tapered bore spherical roller bearings assembled on shafts or adapter sleeves.

Table 13 unit: μ m

Nominal Inner Diameter d mm		Decrease in Radial Internal Clearance		Amount of Axial Press-in				Min.Residual Internal Clearance		
				Bore Conicity at 1:12		Bore Conicity at 1:30				
Over	Below	Min	Max	Min	Max	Min	Max	Co	C3	C4
30	40	0.020	0.025	0.35	0.40	----	----	0.015	0.025	0.040
40	50	0.025	0.030	0.40	0.45	----	----	0.020	0.030	0.050
50	65	0.030	0.040	0.45	0.60	----	----	0.025	0.035	0.055
65	80	0.040	0.050	0.60	0.75	----	----	0.025	0.040	0.070
80	100	0.045	0.060	0.70	0.90	1.70	2.20	0.035	0.050	0.080
100	120	0.050	0.070	0.75	1.10	1.90	2.70	0.050	0.065	0.100
120	140	0.065	0.090	1.10	1.40	2.70	3.50	0.055	0.080	0.110
140	160	0.075	0.100	1.20	1.60	3.00	4.00	0.055	0.090	0.130
160	180	0.080	0.110	1.30	1.70	3.20	4.20	0.060	0.100	0.150
180	200	0.090	0.130	1.40	2.00	3.50	5.00	0.070	0.100	0.160
200	225	0.100	0.140	1.60	2.20	4.00	5.50	0.080	0.120	0.180
225	250	0.110	0.150	1.70	2.40	4.20	6.00	0.090	0.130	0.200
250	280	0.120	0.170	1.90	2.70	4.70	6.70	0.100	0.140	0.220
280	315	0.130	0.190	2.00	3.00	5.00	7.50	0.110	0.150	0.240
315	355	0.150	0.210	2.40	3.30	6.00	8.20	0.120	0.170	0.260
355	400	0.170	0.230	2.60	3.60	6.50	9.00	0.130	0.190	0.290
400	450	0.200	0.260	3.10	4.00	7.70	10.0	0.130	0.200	0.310
450	500	0.210	0.280	3.30	4.40	8.20	11.0	0.160	0.230	0.350
500	560	0.240	0.320	3.70	5.00	9.20	12.5	0.170	0.250	0.360
560	630	0.260	0.350	4.00	5.40	10.0	13.5	0.200	0.290	0.410
630	710	0.300	0.400	4.60	6.20	11.5	15.5	0.210	0.310	0.450
710	800	0.340	0.450	5.30	7.00	13.3	17.5	0.230	0.350	0.510
800	900	0.370	0.500	5.70	7.80	14.3	19.5	0.270	0.390	0.570
900	1000	0.410	0.550	6.30	8.50	15.8	21.0	0.300	0.430	0.640
1000	1120	0.450	0.600	6.80	9.00	17.0	23.0	0.320	0.480	0.700

Mandrel pressure method

Example:
22328CAK/ C3 bearing (140mm ID, C3 set of clearance) is fitted to the tapered shaft

a. Measured the initial radial clearance is 0.178mm with a feeler.
b. From the above table to find out when the radial clearance reduces 0.064 ~ 0.089mm or about 0.076mm, that is the right fit.

initial clearance	0.178mm
adial clearance decrement	−0.076mm
	0.102mm

c. Tighten the lock nut and the radial clearance reaches 0.102mm, finally check the minimum radial clearance after installation, indicating that this value is safe.

Note: The tapered bore spherical roller bearings must leave a suitable radial clearance before installation, which provide the required decrement of radial clearance during installation, and compensate for radial clearance reduction in case of abnormal temperature. For special applications, please inquire our technical department.

Dismounting

Bearing disassembly is necessary in regular maintenance and replacement. If the disassembled bearing will continued to be used, the following procedures should be noted

1. The rolling element cannot bear the force of disassembly.
2. Inner and outer rings cannot be beaten directly when disassembling.
3. Flame cannot be used during disassembling.
4. The disassembled bearing should be cleaned carefully.

The small bearings can be disassembled directly by mechanical pulling equipment, the tightly fitted rings will be removed through the pulling device as shown in Figure 11. The method of induction heating could also be taken.

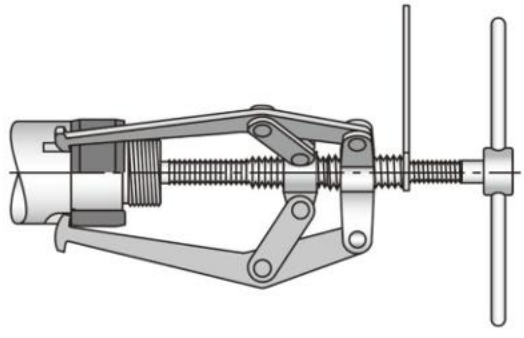


Fig.10

The disassembly of the tapered roller bearing can be conducted by hydraulic disassembly and mechanical disassembly. For the bearing installed on the conical sleeve or the adapter sleeve, it can be disassembled by using metal bar or sleeve after removing the lock nut. See Figs. 11 and 12

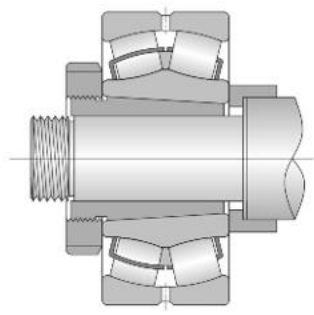


Fig.11

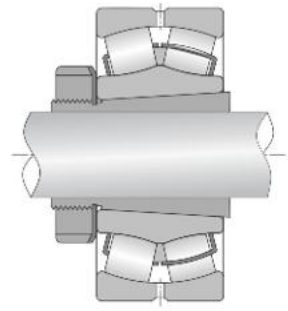


Fig.12

For the disassembly of large−type bearing, it is difficult to use mechanical way, if there is high−pressure oil and oil tank prepared around the parts that bearing is fitted, the oil pressure method could be adapted.

Lubrication

Purposes of Lubrication

The main purposes of lubrication are to reduce friction and wear inside the bearings that may cause premature failure. The effects of lubrication may be briefly explained as follows

(1) Reduction of Friction and Wear

Direct metallic contact between the bearing rings, rolling elements and cage, which are the basic components of a bearing, is prevented by an oil film which reduces the friction and wear in the contact areas.

(2) Extension of Fatigue Life

The rolling fatigue life of bearings depends greatly upon the viscosity and film thickness between the rolling contact surfaces. A heavy film thickness prolongs the fatigue life, but it is shortened if the viscosity of the oil is too low so the film thickness is insufficient.

(3) Dissipation of Frictional Heal and Cooling
Circulation lubrication may be used low carry away frictional heat or heat transferred from the outside to prevent the bearing from overheating and the oil from deteriorating.
(4) Others
Adequate lubrication also helps to prevent foreign material from entering the bearings and guards against corrosion or rusting.

Lubricating Methods

The various lubricating methods are first divided into either grease or oil lubrications. Satisfactory bearing performance can be achieved by adopting the lubricating method which is most suitable for the particular application and operating condition. In general, oil offers superior lubrication, however, grease lubrication allows a simpler structure around the bearings. A comparison of grease and oil lubrication is given in Table 14.

Grease Lubrication

(1) Grease Quantity
The quantity of grease to be packed in a housing depends on the housing design and free space, grease characteristics, and ambient temperature. For example the bearings for the main shafts of machine tool where the accuracy may be impaired by a small temperature rise, require only a small amount of grease. The quantity of grease for ordinary bearings is determined as follows.
Sufficient grease must be packed inside the bearing including the cage guide face The available space inside the housing to be packed with grease depends on the speed as follows:

1/2 to 2/3 of the space .. .
When the speed is less than 50% of the limiting speed.
1 /3 to 1/2 of the space .. .
When the speed is more than 50% of the limiting speed.

Table 14 Comparison of Grease and Oil Lubrication

Item	Grease Lubrication	Oil Lubrication
Housing structure and sealing method	Simple	May be complex, careful maintenance required
Speed	Limiting speed is 65 to 80% of that with oil lubricant	Higher limiting speed
Cooling effect	Poor	Heat transter is possible using forced oil circulation
Fluidity	Poor	Good
Fuil lubricant replacement	Sometimes difficult	Easy
Removal of foreign matter	Removal of particles from grease is impossible	Easy
External contamination due to leakage	Surroundings seldom contaminated by leakage	Often leaks without proper countermeasure. Not suitable if external contamination must be avoided.

Mandrel pressure method

(2) Replacement of Grease
Grease, once packed, usually need not be replenished for a long time; however, for severe operating conditions, grease should be frequently replenished or replaced. In such cases, the bearing housing should be designed to facilitate grease replenishment and replacement.
When replenishment intervals are short, provide replenishment and discharge ports at appropriate positions so deteriorated grease is replaced by fresh grease. For example, the housing space on the grease supply side can be divided into several sections with partitions. The grease on the partitioned side gradually passes through the bearings and old grease forced from the bearing is discharged through a grease valve.

Oil Lubrication

(1) Oil Bath Lubrication
Oil bath lubrication is a widely used with low or medium speeds. The oil level should be at the center of the lowest rolling element. It is desirable to provide a sight gauge so the proper oil level may be maintained

(2) Drip–Feed Lubrication
Drip feed lubrication is widely used for small ball bearings operated at relatively high speeds.

(3) Splash Lubrication
With this lubricating method, oil is splashed onto the bearings by gears or a simple rotating disc installed near bearings without submerging the bearings in oil. It is commonly used in automobile transmissions and final drive gears.

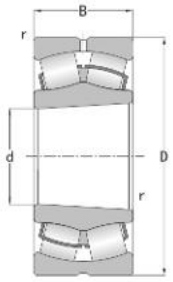
(4) Circulating Lubrication
Circulating lubrication is commonly used for high speed operation requiring bearing cooling and for bearings used at high temperatures.

(5) Jet Lubrication
Jet lubrication is often used for ultra–high speed bearings, such as the bearings in jet engines with a dmn valve (dm: pitch diameter of rolling element set in mm; n: rotational speed in min–1) exceeding one million. Lubricating oil is sprayed under
pressure from one or more nozzles directly into the bearing.

(6) Oil Mist Lubrication
Oil mist lubrication, also called oil fog lubrication, utilizes an oil mist sprayed into a bearing. This method has the following advantages:
(a) Because of the small quantity of oil required, the oil agitation resistance is small, and higher speeds are possible
(b) Contamination of the vicinity around the bearing is slight because the oil leakage is small.
(c) It is relatively easy to continuously supply fresh oil; therefore, the bearing life is extended.

(7) Oil/Air Lubricating Method
Using the oil/air lubricating method, a very small amount of oil is discharged intermittently by a constant–quantity piston into a pipe carrying a constant flow of compressed air. The oil flows along the wall of the pipe and approaches a constant flow rate.
The major advantages of oil/air lubrication are:
(a) Since the minimum necessary amount of oil is supplied, this method is suitable for high speeds because less heat is generated.
(b) Since the minimum amount of oil is fed continuously bearing temperature remains stable. Also, because of the small amount of oil, there is almost no atmospheric pollution.
(c) Since only fresh oil is fed to the bearings, oil deterioration need not be considered.
(d) Since compressed air is always fed to the bearings, the internal pressure is high, so dust, cutting fluid, etc. cannot enter.
For these reasons. this method is used in the main spindles of machine tools and other high speed applications.

Spherical Roller Bearing



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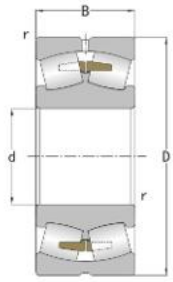

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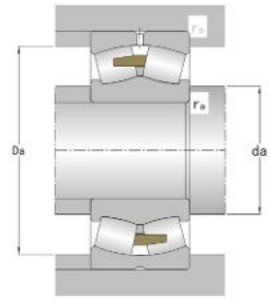
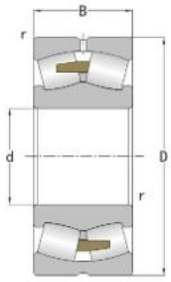


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
40	90	23	1.5	88.8	99	21308CA	21308CAK	4600	5500	49	81	1.5	0.75
	90	23	1.5	88.8	99	21308CC	21308CCK	4600	5500	49	81	1.5	0.743
	90	23	1.5	93.9	102	21308TN1	21308KTN1	4600	5500	49	81	1.5	0.717
	90	33	1.5	89	112	22308MB	22308MBK	5000	6000	49	81	1.5	1.03
	90	33	1.5	123.6	142.1	22308CA	22308CAK	5300	6300	49	81	1.5	1
	90	33	1.5	123.6	142.1	22308CC	22308CCK	5000	7000	49	81	1.5	1.02
	90	33	1.5	133.9	152.4	22308TN1	22308KTN1	5000	7000	48	81	1.5	1.02
45	85	23	1.1	68	83	22209MB	22209MBK	5000	6000	52	78	1	0.59
	85	23	1.1	93	102	22209CA	22209CAK	5500	7000	52	78	1	0.58
	85	23	1.1	93	102	22209CC	22209CCK	5500	7000	52	78	1	0.571
	85	23	1.1	97	105	22209TN1	22209KTN1	5500	7000	52	78	1	0.555
	100	25	1.5	106	118	21309CA	21309CAK	3200	4000	54	91	1.5	1.02
	100	25	1.5	106	118	21309CC	21309CCK	3200	4000	54	91	1.5	1
	100	25	1.5	111	124	21309TN1	21309KTN1	3200	4000	54	91	1.5	0.949
	100	36	1.5	130	152	22309MB	22309MBK	3600	4500	54	91	1.5	1.4
	100	36	1.5	156	175	22309CA	22309CAK	4800	5800	54	91	1.5	1.38
	100	36	1.5	156	175	22309CC	22309CCK	4800	5800	54	91	1.5	1.37
	100	36	1.5	165	191	22309TN1	22309KTN1	4000	5300	54	91	1.5	1.39
50	90	23	1.1	70	89	22210MB	22210MBK	3800	4800	57	83	1	0.87
	90	23	1.1	95	112	22210CA	22210CAK	4600	5400	57	83	1	0.62
	90	23	1.1	95	112	22210CC	22210CCK	4600	5400	57	83	1	0.614
	90	23	1.1	99	113	22210TN1	22210KTN1	4600	5400	57	83	1	0.596

Spherical Roller Bearing



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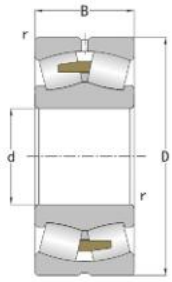

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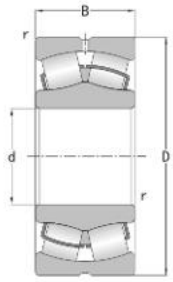

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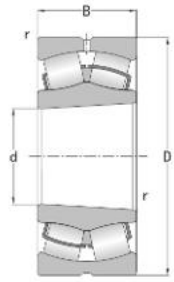
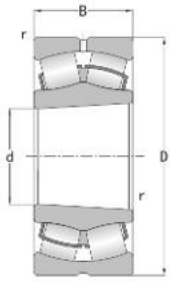


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
50	110	27	2	124	144	21310CA	21310CAK	2800	3800	60	100	2	1.3
	110	27	2	129	144	21310CC	21310CCK	2800	3800	60	100	2	1.3
	110	27	2	129	144	21310TN1	21310KTN1	2800	3800	60	100	2	1.22
	110	40	2	145	175	22310MB	22310MBK	3400	4300	60	100	2	1.9
	110	40	2	185	216	22310CA	22310CAK	4600	5600	60	100	2	1.85
	110	40	2	185	216	22310CC	22310CCK	4600	5600	60	100	2	1.79
	110	40	2	198	235	22310TN1	22310KTN1	4600	5600	60	100	2	1.84
55	100	25	1.5	82	110	22211MB	22211MBK	3400	4300	64	91	1.5	0.86
	100	25	1.5	115	139	22211CA	22211CAK	4000	5000	64	91	1.5	0.84
	100	25	1.5	115	139	22211CC	22211CCK	4000	5200	64	91	1.5	0.847
	100	25	1.5	122	144	22211TN1	22211KTN1	4000	5000	64	91	1.5	0.823
	120	29	2	146	175	21311CA	21311CAK	2600	3400	65	110	2	1.65
	120	29	2	146	175	21311CC	21311CCK	2600	3400	65	110	2	1.65
	120	29	2	149	170	21311TN1	21311KTN1	2600	3400	65	110	2	1.57
	120	43	2	170	204	22311MB	22311MBK	3000	3800	65	110	2	2.4
	120	43	2	224	258	22311CA	22311CAK	4000	4800	65	110	2	2.35
	120	43	2	226	260	22311CC	22311CCK	4000	4800	65	110	2	2.31
60	110	28	1.5	101	126	22212MB	22212MBK	3200	4000	69	101	1.5	1.22
	110	28	1.5	140	166	22212CA	22212CAK	3600	4500	69	101	1.5	1.2
	110	28	1.5	140	166	22212CC	22212CCK	3600	4500	69	101	1.5	1.15
	130	31	2.1	167	201	21312CA	21312CAK	2400	3200	72	118	2.1	2.08
	130	31	2.1	167	201	21312CC	21312CCK	2400	3200	72	118	2.1	2.08
	130	46	2.1	193	243	22312MB	22312MBK	2800	3600	72	118	2.1	3
	130	46	2.1	255	294	22312CA	22312CAK	3800	4400	72	118	2.1	2.95
	130	46	2.1	255	301	22312CC	22312CCK	3800	4400	72	118	2.1	2.88

Spherical Roller Bearing



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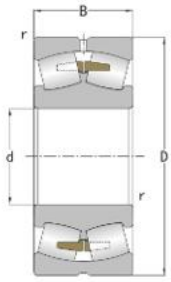

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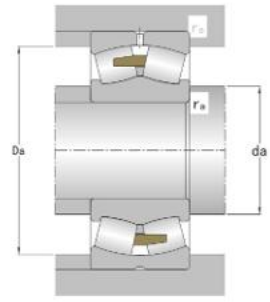
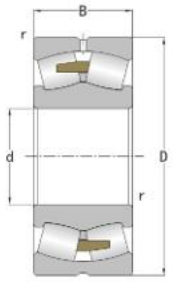


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
65	120	31	1.5	112	158	22213MB	22213MBK	2800	3600	74	111	1.5	1.63
	120	31	1.5	165	207	22213CA	22213CAK	3600	4800	74	111	1.5	1.6
	120	31	1.5	165	207	22213CC	22213CCK	3600	4800	74	111	1.5	1.54
	140	33	2.1	188	235	21313CA	21313CAK	2200	3000	77	128	2.1	2.57
	140	33	2.1	188	235	21313CC	21313CCK	2200	3000	77	128	2.1	2.57
	140	48	2.1	222	296	22313MB	22313MBK	2400	3200	77	128	2.1	3.6
	140	48	2.1	282	342	22313CA	22313CAK	3600	4200	77	128	2.1	3.55
	140	48	2.1	282	242	22313CC	22313CCK	3600	4200	77	128	2.1	3.47
70	125	31	1.5	126	175	22214MB	22214MBK	2600	3400	79	116	1.5	1.66
	125	31	1.5	170	221	22214CA	22214CAK	3600	4600	79	116	1.5	1.7
	125	31	1.5	170	221	22214CC	22214CCK	3600	4600	79	116	1.5	1.6
	150	35	2.1	218	276	21314CA	21314CAK	2000	2800	82	138	2.1	3.11
	150	35	2.1	218	276	21314CC	21314CCK	2000	2800	82	138	2.1	3.11
	150	51	2.1	265	325	22314MB	22314MBK	2200	3000	82	138	2.1	4.4
	150	51	2.1	321	373	22314CA	22314CAK	3600	4000	82	138	2.1	4.4
	150	51	2.1	321	407	22314CC	22314CCK	3600	4000	82	138	2.1	4.34
75	130	31	1.5	120	146	22215MB	22215MBK	2400	3200	84	121	1.5	1.75
	130	31	1.5	172	222	22215CA	22215CAK	3400	4200	84	121	1.5	1.8
	130	31	1.5	172	222	22215CC	22215CCK	3400	4200	84	121	1.5	1.69
	160	37	2.1	245	311	21315CA	21315CAK	1900	2600	87	148	2.1	3.76
	160	37	2.1	245	311	21315CC	21315CCK	1900	2600	87	148	2.1	3.76
	160	55	2.1	290	400	22315MB	22315MBK	2000	2800	87	148	2.1	5.4
	160	55	2.1	352	451	22315CA	22315CA	3000	3600	87	148	2.1	5.25
	160	55	2.1	358	461	22315CC	22315CC	3000	3600	87	148	2.1	5.28

Spherical Roller Bearing



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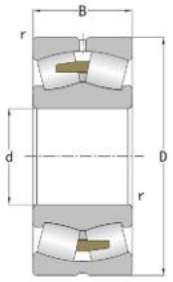

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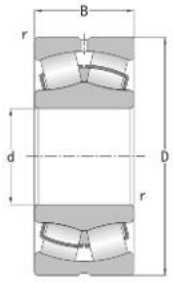

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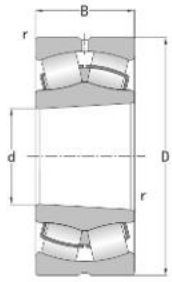
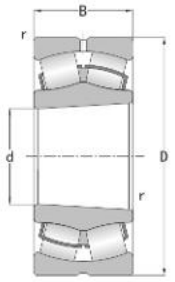


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
80	140	33	2	140	220	22216MB	22216MBK	2200	3000	90	130	2	2.2
	140	33	2	210	265	22216CA	22216CAK	3200	3800	90	130	2	2.2
	140	33	2	210	265	22216CC	22216CCK	3200	3800	90	130	2	2.13
	170	39	2.1	268	359	21316CA	21316CAK	1800	2400	92	158	2.1	4.47
	170	39	2.1	268	359	21316CC	21316CCK	1800	2400	92	158	2.1	4.47
	170	58	2.1	320	447	22316MB	22316MBK	1900	2600	92	158	2.1	6.4
	170	58	2.1	410	513	22316CA	22316CAK	2800	3400	92	158	2.1	6.39
	170	58	2.1	410	523	22316CC	22316CCK	2800	3400	92	158	2.1	6.32
85	150	36	2	149	235	22217MB	22217MBK	2000	2800	95	140	2	2.8
	150	36	2	256	330	22217CA	22217CAK	3000	3800	95	140	2	2.7
	150	36	2	256	330	22217CC	22217CCK	3000	3800	95	140	2	2.67
	180	41	3	307	397	21317CA	21317CAK	1700	2200	99	166	2.5	5.23
	180	41	3	307	397	21317CC	21317CCK	1700	2200	99	166	2.5	5.23
	180	60	3	350	472	22317MB	22317MBK	1800	2400	99	166	2.5	7.4
	180	60	3	433	556	22317CA	22317CAK	2500	3200	99	166	2.5	7.25
	180	60	3	443	572	22317CC	22317CCK	2500	3200	99	166	2.5	7.27
90	160	40	2	202	286	22218MB	22218MBK	1900	2600	100	150	2	4
	160	40	2	278	358	22218CA	22218CAK	2800	3600	100	150	2	3.28
	160	40	2	278	358	22218CC	22218CCK	2800	3600	100	150	2	3.38
	160	52	2	365	492	23218CA	23218CAK	1700	2200	100	150	2	4.6
	160	52	2	365	497	23218CC	23218CCK	1800	2400	100	150	2	4.4
	190	43	3	330	433	21318CA	21318CAK	1600	2200	104	176	2.5	6.17
	190	43	3	330	433	21318CC	21318CCK	1600	2200	104	176	2.5	6.17
	190	64	3	376	558	22318MB	22318MBK	1700	2200	104	176	2.5	8.8
	190	64	3	489	641	22318CA	22318CAK	2600	3000	104	176	2.5	8.6
	190	64	3	497	659	22318CC	22318CCK	2600	3000	104	176	2.5	8.63

Spherical Roller Bearing



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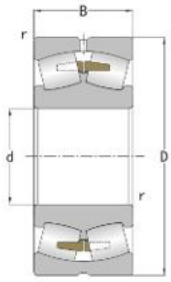
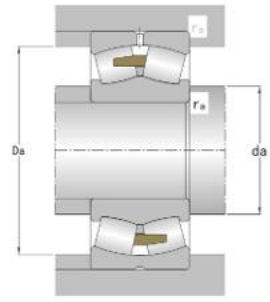
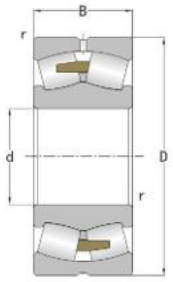


MB/W33

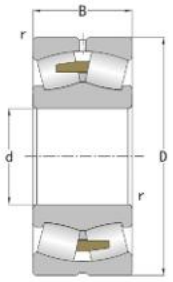


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
95	170	43	2.1	218	362	22219MB	22219MBK	1800	2400	107	158	2.1	4.2
	170	43	2.1	310	402	22219CA	22219CAK	2600	3000	107	158	2.1	4.1
	170	43	2.1	310	402	22219CC	22219CCK	2600	3000	107	158	2.1	4.2
	200	45	3	366	500	21319CA	21319CAK	1700	2200	109	186	2.5	7.15
	200	45	3	366	500	21319CC	21319CCK	1700	2200	109	186	2.5	7.15
	200	67	3	397	587	22319MB	22319MBK	1600	2000	109	186	2.5	10.3
	200	67	3	536	709	22319CA	22319CAK	2200	2800	109	186	2.5	10.1
	200	67	3	546	726	22319CC	22319CCK	2200	2800	109	186	2.5	9.97
100	165	52	2	360	540	23120CA	23120CAK	1600	2000	110	155	2	5
	165	52	2	362	545	23120CC	23120CCK	1700	2200	110	155	2	4.31
	150	50	1.5	251	448	24020CA	24020CAK30	1200	1500	110	140	1.5	3.035
	150	50	1.5	260	461	24020CC	24020CCK30	1200	1500	110	140	1.5	3.035
	180	46	2.1	229	369	22220MB	22220MBK	1700	2200	112	168	2.1	5
	180	46	2.1	352	438	22220CA	22220CAK	2500	3200	112	168	2.1	5
	180	46	2.1	352	448	22220CC	22220CCK	2600	3200	112	168	2.1	5.01
	180	60	2.1	428	637	23220CA	23220CAK	1600	2000	112	168	2.1	6.7
	180	60	2.1	433	649	23220CC	23220CCK	1600	2200	112	168	2.1	6.52
	215	47	3	397	546	21320CA	21320CAK	1600	2000	114	201	2.5	8.81
	215	47	3	397	546	21320CC	21320CCK	1600	2000	114	201	2.5	8.81
	215	73	3	464	688	22320MB	22320MBK	1800	2200	114	201	2.5	13
	215	73	3	626	840	22320CA	22320CA	2200	2600	114	201	2.5	13.4
	215	73	3	637	857	22320CC	22320CC	2200	2600	114	201	2.5	12.8

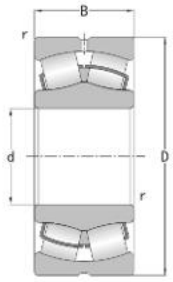
Spherical Roller Bearing



CA/W33



CAK/W33



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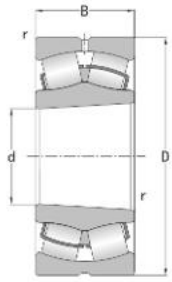
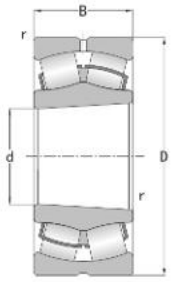


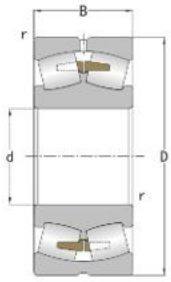
CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
105	175	56	2	249	494	23121MB	23121MBK	1400	1800	119	161	2.5	6.64
	225	49	2	420	575	21321CA	21321CAK	1500	1900	119	211	2.5	10
	225	49	2	420	575	21321CC	21321CCK	1500	1900	119	211	2.5	10
110	170	45	2	201	422	23022MB	23022MBK	1400	1800	120	160	2	3.9
	170	45	2	278	461	23022CA	23022CAK	1500	1900	120	160	2	3.9
	170	45	2	280	466	23022CC	23022CCK	1500	1900	120	160	2	3.68
	180	56	2	270	489	23122MB	23122MBK	1300	1700	120	170	2	6.1
	180	56	2	386	613	23122CA	23122CAK	1300	1700	120	170	2	6.25
	180	56	2	389	620	23122CC	23122CCK	1600	2000	120	170	2	5.51
	180	69	2	472	798	24122CA	24122CAK30	1600	2000	120	170	2	6.63
	180	69	2	472	798	24122CC	24122CCK30	1600	2000	120	170	2	6.63
	200	53	2.1	297	479	22222MB	22222MBK	1800	2200	122	188	2.1	7.4
	200	53	2.1	447	592	22222CA	22222CAK	2200	3000	122	188	2.1	7.2
	200	53	2.1	452	606	22222CC	22222CCK	2400	3000	122	188	2.1	7.32
	200	70	2.1	530	809	23222CA	23222CAK	1400	1800	122	188	2.1	9.7
	200	70	2.1	536	824	23222CC	23222CCK	1500	1900	122	188	2.1	9.46
	240	50	3	460	635	21322CA	21322CAK	1400	1800	124	226	2.5	11.8
	240	50	3	474	654	21322CC	21322CCK	1400	1800	124	226	2.5	11.8
	240	80	3	561	857	22322MB	22322MBK	1200	1600	124	226	2.5	18.1
	240	80	3	786	993	22322CA	22322CAK	1800	2200	124	226	2.5	18
	240	80	3	786	997	22322CC	22322CCK	1900	2300	124	226	2.5	17.5

Spherical Roller Bearing



CCK/W33



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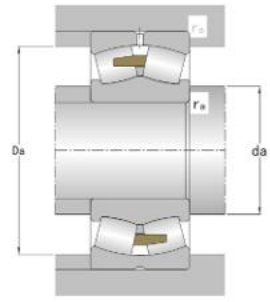
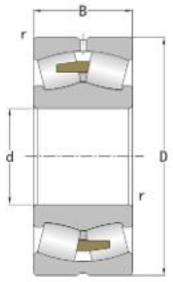


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
120	180	46	2	218	484	23024MB	23024MBK	1200	1600	130	170	2	4.3
	180	46	2	354	560	23024CA	23024CAK	1400	1800	130	170	2	4.3
	180	46	2	359	565	23024CC	23024CCK	1800	2200	130	170	2	3.98
	180	60	2	390	700	24024CA	24024CAK30	1500	2000	130	170	2	5.05
	180	60	2	391	700	24024CC	24024CCK30	1500	2000	130	170	2	5.05
	200	62	2	321	589	23124MB	23124MBK	1100	1500	130	190	2	7.63
	200	62	2	531	780	23124CA	23124CAK	1300	1700	130	190	2	7.63
	200	62	2	530	780	23124CC	23124CCK	1400	1800	130	190	2	7.67
	200	80	2	645	1028	24124CA	24124CAK30	1400	1800	130	190	2	9.65
	200	80	2	645	1028	24124CC	24124CCK30	1400	1800	130	190	2	9.65
	215	58	2.1	352	582	22224MB	22224MBK	1300	1700	132	203	2.1	9.2
	215	58	2.1	520	730	22224CA	22224CAK	2500	2800	132	203	2.1	9
	215	58	2.1	520	730	22224CC	22224CCK	2500	2800	132	203	2.1	9.1
	215	76	2.1	660	968	23224CA	23224CAK	1300	1700	132	203	2.1	12
	215	76	2.1	668	984	23224CC	23224CCK	1300	1700	132	203	2.1	11.7
	260	86	3	664	1022	22324MB	22324MBK	1100	1500	134	246	2.5	22
	260	86	3	867	1154	22324CA	22324CAK	1700	2000	134	246	2.5	22
	260	86	3	870	1195	22324CC	22324CCK	1900	2200	134	246	2.5	22.2
130	200	52	2	278	626	23026MB	23026MBK	1100	1500	140	190	2	6.2
	200	52	2	383	644	23026CA	23026CAK	1200	1600	140	190	2	6.2
	200	52	2	386	649	23026CC	23026CCK	1700	2000	140	190	2	5.85
	200	69	2	472	852	24026CA	24026CAK30	1400	1800	140	190	2	7.55
	200	69	2	486	878	24026CC	24026CCK30	1400	1800	140	190	2	7.55
	210	64	2	492	812	23126CA	23126CAK	1300	1700	140	200	2	8.49
	210	64	2	496	826	23126CC	23126CCK	1300	1700	140	200	2	8.49

Spherical Roller Bearing



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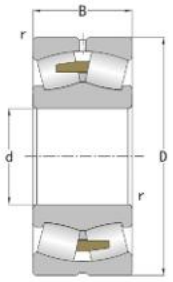
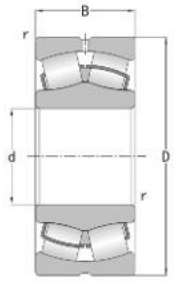


CAK/W33



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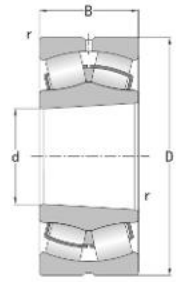
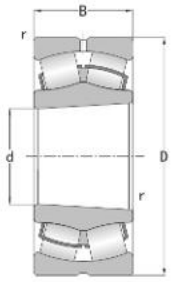


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
130	210	80	2	585	1030	24126CA	24126CAK30	1200	1600	140	200	2	10.3
	210	80	2	603	1061	24126CC	24126CCK30	1300	1700	140	200	2	10.3
	230	64	3	420	729	22226MB	22226MBK	1200	1600	144	216	2.5	11.2
	230	64	3	625	864	22226CA	22226CAK	2000	2600	144	216	2.5	11.2
	230	64	3	625	867	22226CC	22226CCK	2200	2600	144	216	2.5	11.2
	230	80	3	748	1092	23226CA	23226CAK	1200	1600	144	216	2.5	14
	230	80	3	748	1112	23226CC	23226CCK	1200	1600	144	216	2.5	13.8
	280	93	4	744	1170	22326MB	22326MBK	950	1300	148	262	3	29
	280	93	4	970	1340	22326CA	22326CAK	1600	1900	148	262	3	28.5
	280	93	4	994	1380	22326CC	22326CCK	1600	1900	148	262	3	27.5
140	210	53	2	294	654	23028MB	23028MBK	950	1300	150	200	2	6.7
	210	53	2	444	719	23028CA	23028CAK	1100	1500	150	200	2	6.7
	210	53	2	450	760	23028CC	23028CCK	1600	1900	150	200	2	6.31
	210	69	2	488	895	24028CA	24028CAK30	1200	1600	150	200	2	8.01
	210	69	2	503	922	24028CC	24028CCK30	1300	1700	150	200	2	8.01
	225	68	2.1	410	623	23128MB	23128MBK	950	1300	152	213	2.1	10.9
	225	68	2.1	561	953	23128CA	23128CAK	1100	1500	152	213	2.1	10.9
	225	68	2.1	554	932	23128CC	23128CCK	1200	1600	152	213	2.1	10.2
	225	85	2.1	670	1200	24128CA	24128CAK30	1100	1500	152	213	2.1	12.5
	225	85	2.1	690	1236	24128CC	24128CCK30	1200	1600	152	213	2.1	12.5
	250	68	3	492	829	22228MB	22228MBK	1000	1400	154	236	2.5	14.5
	250	68	3	720	990	22228CA	22228CAK	1700	2200	154	236	2.5	14.5
	250	68	3	720	990	22228CC	22228CCK	1800	2200	154	236	2.5	14.2
	250	88	3	826	1320	23228CA	23228CAK	1000	1400	154	236	2.5	18.5
	250	88	3	836	1340	23228CC	23228CCK	1100	1500	154	236	2.5	18.1

Spherical Roller Bearing



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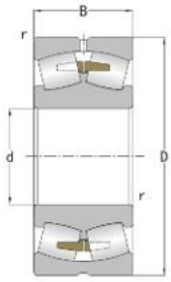

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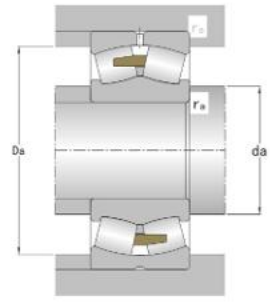
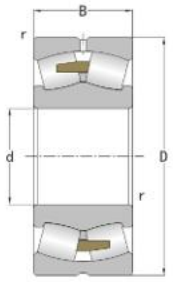


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
140	300	102	4	850	1380	22328MB	22328MBK	900	1200	158	282	3	36
	300	102	4	1140	1620	22328CA	22328CAK	1400	1500	158	282	3	34.5
	300	102	4	1164	1660	22328CC	22328CCK	1400	1700	158	282	3	34.6
150	225	56	2.1	338	790	23030MB	23030MBK	900	1200	162	213	2.1	8.14
	225	56	2.1	451	790	23030CA	23030CAK	1100	1400	162	213	2.1	8.14
	225	56	2.1	445	772	23030CC	23030CCK	1400	1800	162	213	2.1	7.74
	225	75	2.1	570	1070	24030CA	24030CAK30	1100	1400	162	213	2.1	10.6
	225	75	2.1	587	1100	24030CC	24030CCK30	1200	1500	162	213	2.1	10.1
	250	80	2.1	527	1110	23130MB	23130MBK	850	1100	162	238	2.1	16.1
	250	80	2.1	747	1267	23130CA	23130CAK	1000	1300	162	238	2.1	16.1
	250	80	2.1	760	1288	23130CC	23130CCK	1100	1400	162	238	2.1	15.7
	250	100	2.1	890	1600	24130CA	24130CAK30	1000	1300	162	238	2.1	19
	250	100	2.1	910	1650	24130CC	24130CCK30	1100	1400	162	238	2.1	19
	270	73	3	523	900	22230MB	22230MBK	1200	1700	164	256	2.5	18.5
	270	73	3	970	1330	22230CA	22230CAK	1800	2000	164	256	2.5	18.6
	270	73	3	970	1130	22230CC	22230CCK	1800	2000	164	256	2.5	18
	270	96	3	963	1560	23230CA	23230CAK	950	1300	164	256	2.5	24
	270	96	3	976	1586	23230CC	23230CCK	1100	1400	164	256	2.5	23.2
	320	108	4	1050	1790	22330MB	22330MBK	850	1100	168	302	3	43
	320	108	4	1270	1850	22330CA	22330CAK	1200	1500	168	302	3	42.5
	320	108	4	1308	1905	22330CC	22330CCK	1200	1500	168	302	3	42
160	240	60	2.1	379	850	23032MB	23032MBK	850	1100	172	228	2.1	10
	240	60	2.1	515	900	23032CA	23032CAK	1000	1300	172	228	2.1	10
	240	60	2.1	523	915	23032CC	23032CCK	1300	1700	172	228	2.1	9.43
	240	80	2.1	652	1230	24032CA	24032CAK30	1000	1300	172	228	2.1	12.2

Spherical Roller Bearing



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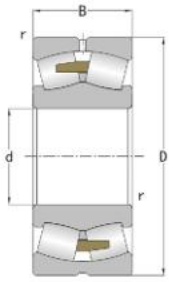

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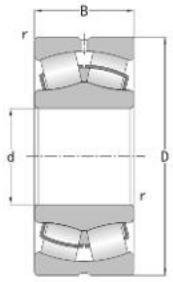

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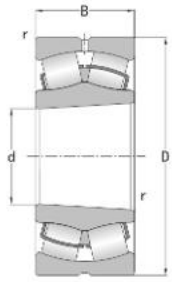
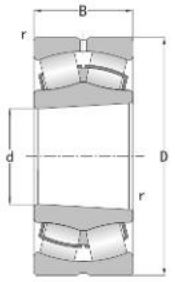


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
160	240	80	2.1	670	1260	24032CC	24032CCK30	1100	1400	172	228	2.1	12.2
	270	86	2.1	536	1140	23132MB	23132MBK	800	1000	172	258	2.1	19.7
	270	86	2.1	870	1460	23132CA	23132CAK	900	1200	172	258	2.1	19.7
	270	86	2.1	870	1480	23132CC	23132CCK	1000	1300	172	258	2.1	19.8
	270	109	2.1	1040	1880	24132CA	24132CAK30	900	1200	172	258	2.1	24.6
	270	109	2.1	1070	1930	24132CC	24132CCK30	1000	1300	172	258	2.1	24.4
	290	80	3	660	1170	22232MB	22232MBK	1500	1700	174	276	2.5	22.2
	290	80	3	895	1280	22232CA	22232CAK	1700	1900	174	276	2.5	23.1
	290	80	3	901	1320	22232CC	22232CCK	1200	1900	174	276	2.5	22.9
	290	104	3	1112	1810	23232CA	23232CAK	900	1200	174	276	2.5	30
	290	104	3	1120	1830	23232CC	23232CCK	1100	1400	174	276	2.5	29.4
	340	114	4	1370	1820	22332MB	22332MBK	1100	1300	178	322	3	51
170	260	67	2.1	458	1040	23034MB	23034MBK	800	1000	182	248	2.1	13
	260	67	2.1	726	1112	23034CA	23034CAK	900	1200	182	248	2.1	13
	260	67	2.1	733	1133	23034CC	23034CCK	1200	1600	182	248	2.1	12.8
	260	90	2.1	792	1520	24034CA	24034CAK30	900	1200	182	248	2.1	16.7
	260	90	2.1	816	1565	24034CC	24034CCK30	1000	1300	182	248	2.1	16.7
	280	88	2.1	911	1565	23134CA	23134CAK	850	1100	182	268	2.1	21.1
	280	88	2.1	927	1590	23134CC	23134CCK	1000	1300	182	268	2.1	21.1
	280	109	2.1	1070	1930	24134CA	24134CAK30	900	1200	182	268	2.1	25.5
	280	109	2.1	1100	1980	24134CC	24134CCK30	1000	1300	182	268	2.1	25.5
	310	86	4	740	1330	22234MB	22234MBK	1100	1300	188	292	3	29
	310	86	4	975	1500	22234CA	22234CAK	1300	1600	188	292	3	29
	310	86	4	1002	1540	22234CC	22234CCK	1100	1400	188	292	3	28.1
	310	110	4	1200	2030	23234CA	23234CAK	800	1100	188	292	3	35.7
	310	110	4	1230	2090	23234CC	23234CCK	900	1200	188	292	3	35.7
	360	120	4	1380	2120	22334CA	22334CAK	1100	1200	188	342	3	60

Spherical Roller Bearing



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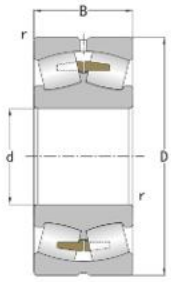

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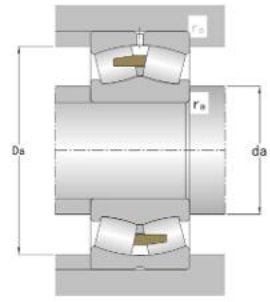
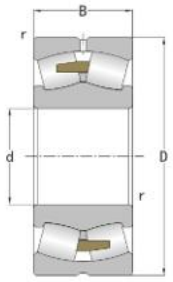


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
180	280	74	2.1	556	1260	23036MB	23036MBK	750	950	192	268	2.1	17.6
	280	74	2.1	830	1350	23036CA	23036CAK	900	1100	192	268	2.1	17.6
	280	74	2.1	840	1350	23036CC	23036CCK	1200	1400	192	268	2.1	16.9
	280	100	2.1	928	1820	24036CA	24036CAK30	900	1100	192	268	2.1	22.1
	280	100	2.1	955	1870	24036CC	24036CCK30	1100	1300	192	268	2.1	22.1
	300	96	3	950	1620	23136MB	23136MBK	750	900	194	286	2.5	27.1
	300	96	3	1060	1850	23136CA	23136CAK	800	1000	194	286	2.5	27.1
	300	96	3	1080	1880	23136CC	23136CCK	900	1200	194	286	2.5	26.9
	300	118	3	1210	2220	24136CA	24136CAK30	800	1000	194	286	2.5	32
	300	118	3	1240	2280	24136CC	23136CCK30	900	1200	194	286	2.5	32
	320	86	4	757	1410	22236MB	22236MBK	900	1100	198	302	3	30
	320	86	4	1010	1590	22236CA	22236CAK	1300	1500	198	302	3	30
	320	86	4	1040	1630	22236CC	22236CCK	1100	1300	198	302	3	29.4
	320	112	4	1280	2170	23236CA	23236CAK	1000	1200	198	302	3	37.9
	320	112	4	1310	2230	23236CC	23236CCK	1100	1300	198	302	3	37.9
	380	126	4	1490	2330	22336CA	22336CAK	1000	1100	198	362	3	70
190	290	75	2.1	570	1260	23038MB	23038MBK	700	900	202	278	2.1	20
	290	75	2.1	867	1490	23038CA	23038CAK	1000	1200	202	278	2.1	20
	290	75	2.1	877	1520	23038CC	23038CCK	1100	1400	202	278	2.1	17.7
	290	100	2.1	975	1910	24038CA	24038CAK30	800	1100	202	278	2.1	23
	290	100	2.1	1004	1960	24038CC	24038CCK30	900	1200	202	278	2.1	23
	320	104	3	811	1880	23138MB	23138MBK	670	850	204	306	2.5	35.3
	320	104	3	1200	2120	23138CA	23138CAK	750	1000	204	306	2.5	35.3
	320	104	3	1230	2180	23138CC	23138CCK	850	1100	204	306	2.5	17.7
	320	128	3	1410	2590	24138CA	24138CAK30	700	1000	204	306	2.5	40.2
	320	128	3	1450	2660	24138CC	24138CCK30	850	1100	204	306	2.5	40.2

Spherical Roller Bearing



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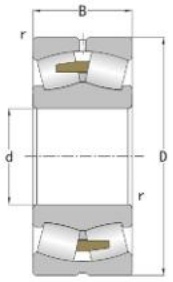

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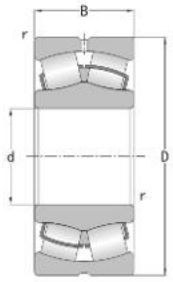

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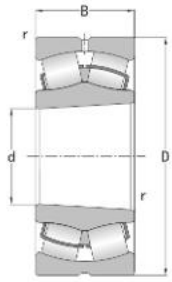
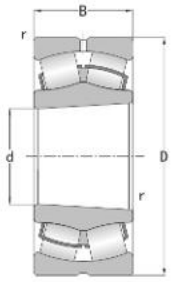


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
190	340	92	4	1100	1655	22238CA	22238CAK	1200	1500	208	322	3	35.3
	340	120	4	1450	2490	23238CA	23238CAK	700	1000	208	322	3	46.1
	340	120	4	1490	2550	23238CC	23238CCK	800	1100	208	322	3	46.1
	400	132	5	1730	2600	22338CA	22338CAK	900	1000	212	378	4	81
200	310	82	2.1	597	1340	23040MB	23040MBK	670	850	212	298	2.1	24
	310	82	2.1	890	1650	23040CA	23040CAK	900	1100	212	298	2.1	24
	310	82	2.1	916	1690	23040CC	23040CCK	1000	1300	212	298	2.1	22.7
	310	109	2.1	1120	2220	24040CA	24040CAK30	670	850	212	298	2.1	29.3
	310	109	2.1	1150	2280	24040CC	24040CCK30	850	1100	212	298	2.1	29.3
	340	112	3	937	2070	23140MB	23140MBK	630	800	214	326	2.5	50.7
	340	112	3	1420	2530	23140CC	23140CCK	800	1000	214	326	2.5	47.6
	340	140	3	1480	2550	24140MB	24140KMB30	700	900	214	326	2.5	49.55
	340	140	3	1620	3030	24140CC	24140CCK30	800	1000	214	326	2.5	49.9
	360	98	4	1100	1890	22240CA	22240CAK	1100	1400	218	342	3	47.7
	360	128	4	1650	2870	23240CC	23240CCK	750	1000	218	342	3	55.4
	420	138	5	1730	2800	22340CA	22340CAK	730	900	222	398	4	94
220	340	90	3	783	1860	23044MB	23044MBK	600	750	234	326	2.5	28.8
	340	90	3	1090	2040	23044CC	23044CCK	950	1200	234	326	2.5	29.7
	340	118	3	1370	2760	24044CC	24044CCK30	750	1000	234	326	2.5	38.1
	370	120	4	1060	2420	23144MB	23144MBK	600	750	238	352	3	55
	370	120	4	1610	2900	23144CC	23144CCK	700	950	238	352	3	51.5
	370	150	4	1900	3580	24144CC	24144CCK30	700	950	238	352	3	62.3
	400	108	4	1500	2380	22244CA	22244CAK	730	900	238	382	3	61.5
	400	144	4	2130	3720	23244CC	23244CCK	670	900	238	382	3	78.5
	460	145	5	2140	3290	22344CA	22344CAK	660	800	242	438	4	120

Spherical Roller Bearing



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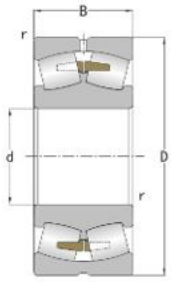

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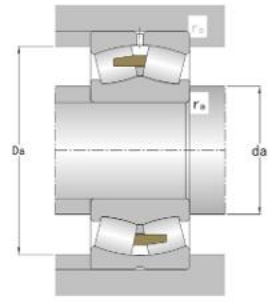
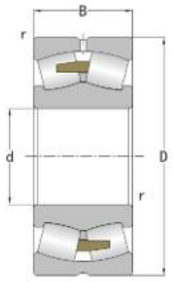


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
240	360	92	3	816	2120	23048MB	23048MBK	530	670	254	346	2.5	35.5
	360	92	3	1160	2220	23048CC	23048CCK	850	1100	254	346	2.5	32.4
	360	118	3	1440	2930	24048CC	24048CCK30	700	950	254	346	2.5	40.8
	400	128	4	1230	2910	23148MB	23148MBK	500	630	258	382	3	55.5
	400	128	4	1840	3310	23148CC	23148CCK	670	850	258	382	3	63.7
	400	160	4	2160	4090	24148CC	24148CCK30	670	850	258	382	3	76.9
	440	160	4	2560	4620	23248CC	23248CCK	630	800	258	422	3	107.3
	500	155	5	2580	3640	22348CA	22348CAK	600	750	262	478	4	153
260	400	104	4	1030	2520	23052CA	23052CAK	500	630	278	382	3	515
	400	104	4	1460	2850	23052CC	23052CCK	900	1100	278	382	3	47.7
	400	140	4	1840	3850	24052CC	24052CCK30	630	850	278	382	3	62.4
	440	144	4	1470	3410	23152MB	23152MBK	450	560	278	422	3	95.3
	440	144	4	2270	4190	23152CC	23152CCK	600	800	278	422	3	88.2
	440	180	4	2730	5330	24152CC	24152CCK30	600	800	278	422	3	107.6
	540	165	6	2860	4310	22352CA	22352CAK	480	700	288	512	5	191
280	420	106	4	1110	2760	23056CA	23056CAK	450	560	298	402	3	62
	420	106	4	1580	3030	23056CC	23056CCK	700	900	298	402	3	50.9
	420	140	4	1960	4100	24056CC	24056CCK	600	800	298	402	3	65.8
	460	146	5	1635	3730	23156CA	23156CAK	430	530	302	438	4	103
	460	146	5	2380	4410	23156CC	23156CCK	560	750	302	438	4	94.1
	460	180	5	2810	5480	24156CC	24156CCK30	560	750	302	438	4	113.2
	500	130	5	2150	3480	22256MB	22256MBK	800	900	302	478	4	112.3
	580	175	6	3490	5200	22356CA	22356CAK	450	600	308	552	5	238
300	380	60	3	650	1600	23860CA	23860CAK	1300	900	310	368	2	18.5
	420	90	3	1050	2500	23960CA	23960CAK	1300	950	314	406	2.5	40.1
	420	90	3	1050	2500	23960MB	23960MBK	1300	950	314	406	2.5	40.1
	420	90	3	1050	2500	23960CC	23960CCK	1300	950	314	406	2.5	39.7
	460	118	4	1610	3450	23060CA	23060CAK	1000	800	318	442	3	72.5

Spherical Roller Bearing



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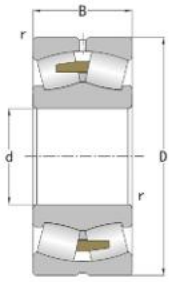

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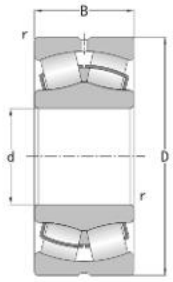

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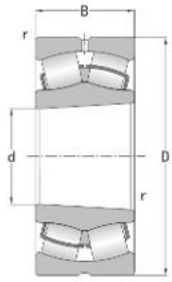
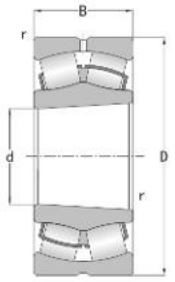


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
300	460	118	4	1610	3450	23060MB	23060MBK	1000	800	318	442	3	72.5
	460	118	4	1610	3450	23060CC	23060CCK	1000	800	318	442	3	70.8
	460	160	4	2020	4370	24060CA	24060CAK30	750	600	318	442	3	99.0
	460	160	4	2020	4370	24060MB	24060MBK30	750	600	318	442	3	100.0
	460	160	4	2020	4370	24060CC	24060CCK30	750	600	318	442	3	98.2
	500	160	5	2310	4750	23160CA	23160CAK	850	670	322	478	4	126
	500	160	5	2310	4750	23160MB	23160MBK	850	670	322	478	4	126
	500	160	5	2310	4750	23160CC	23160CCK	850	670	322	478	4	125
	500	200	5	2600	5430	24160CA	24160CAK30	720	560	322	478	4	159
	500	200	5	2600	5430	24160MB	24160MBK30	720	560	322	478	4	160
	500	200	5	2600	5430	24160CC	24160CCK30	720	560	322	478	4	159
	540	140	5	2310	4000	22260CA	22260CAK	950	750	322	518	4	138
	540	140	5	2310	4000	22260MB	22260MBK	950	750	322	518	4	139
	540	140	5	2310	4000	22260CC	22260CCK	950	750	322	518	4	137
	540	192	5	3200	5600	23260CA	23260CAK	670	530	322	518	4	192
	540	192	5	3200	5600	23260MB	23260MBK	670	530	322	518	4	192
	540	192	5	3200	5600	23260CC	23260CCK	670	530	322	518	4	191
	620	185	7.5	3500	5800	22360CA	22360CAK	650	500	336	584	6	270
	620	185	7.5	3500	5800	22360MB	22360MBK	650	500	336	584	6	270
320	400	60	2.1	650	1620	23864CA	23864CAK	1250	900	332	388	2	20.3
	400	80	2.1	850	2050	24864CA	24864CAK30	1350	1050	332	388	2	22.9
	440	90	3	1140	2660	23964CA	23964CAK	1200	900	334	426	2.5	43.0
	440	90	3	1140	2660	23964MB	23964MBK	1200	900	334	426	2.5	43.0
	440	90	3	1140	2660	23964CC	23964CCK	1200	900	334	426	2.5	42.5
	480	121	4	1930	3850	23064CA	23064CAK	1000	800	338	462	3	78.5
	480	121	4	1930	3850	23064MB	23064MBK	1000	800	338	462	3	78.5
	480	121	4	1930	3850	23064CC	23064CCK	1000	800	338	462	3	76.2
	480	160	4	2280	4850	24064CA	24064CAK30	700	560	338	462	3	106
	480	160	4	2280	4850	24064MB	24064MBK30	700	560	338	462	3	107
	480	160	4	2280	4850	24064CC	24064CCK30	700	560	338	462	3	105

Spherical Roller Bearing



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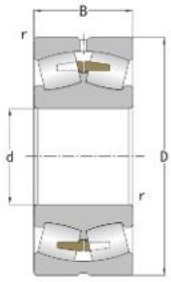

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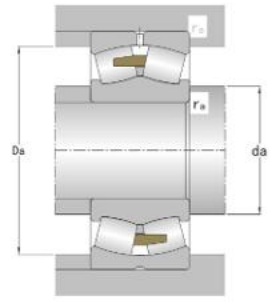
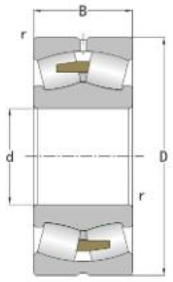


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
320	540	176	5	2815	5800	23164CA	23164CAK	800	630	342	518	4	195
	540	176	5	2815	5800	23164MB	23164MBK	800	630	342	518	4	195
	540	176	5	2815	5800	23164CC	23164CCK	800	630	342	518	4	194
	540	218	5	3200	6800	24164CA	24164CAK30	700	500	342	518	4	167
	540	218	5	3200	6800	24164MB	24164MBK30	700	500	342	518	4	167
	540	218	5	3200	6800	24164CC	24164CCK30	700	500	342	518	4	166
	580	150	5	2490	4550	22264CA	22264CAK	850	670	342	558	4	175
	580	150	5	2490	4550	22264MB	22264MBK	850	670	342	558	4	176
	580	150	5	2490	4550	22264CC	22264CCK	850	670	342	558	4	174
	580	208	5	3500	6800	23264CA	23264CAK	630	500	342	558	4	253
	580	208	5	3500	6800	23264MB	23264MBK	630	500	342	558	4	253
	580	208	5	3500	6800	23264CC	23264CCK	630	500	342	558	4	252
	670	200	7.5	3900	6450	22364CA	22364CAK	600	450	345	590	6	252
	670	200	7.5	3900	6450	22364MB	22364MBK	600	450	345	590	6	353
339	620	194	5	2750	5200	206339CA	206339CAK	700	500	400	560	4	260
340	460	90	3	1200	2700	23968CA	23968CAK	1200	900	354	446	2.5	45.6
	460	90	3	1200	2700	23968MB	23968MBK	1200	900	354	446	2.5	45.6
	460	90	3	1200	2700	23968CC	23968CCK	1200	900	354	446	2.5	45.1
	520	133	5	1980	4400	23068CA	23068CAK	900	700	362	498	4	104
	520	133	5	1980	4400	23068MB	23068MBK	900	700	362	498	4	404
	520	133	5	1980	4400	23068CC	23068CCK	900	700	362	498	4	102
	520	180	5	2460	5700	24068CA	24068CAK30	670	530	362	498	4	137
	520	180	5	2460	5700	24068MB	24068MBK30	670	530	362	498	4	138
	520	180	5	2460	5700	24068CC	24068CCK30	670	530	362	498	4	136
	580	190	5	3050	6300	23168CA	23168CAK	750	600	362	558	4	211
	580	190	5	3050	6300	23168MB	23168MBK	750	600	362	558	4	211
	580	190	5	3050	6300	23168CC	23168CCK	750	600	362	558	4	210
	580	243	5	3800	8250	24168CA	24168CAK30	600	400	362	558	4	269
	580	243	5	3800	8250	24168MB	24168MBK30	600	400	362	558	4	269

Spherical Roller Bearing



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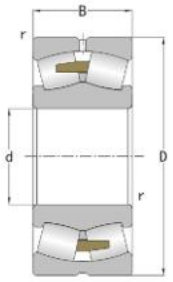

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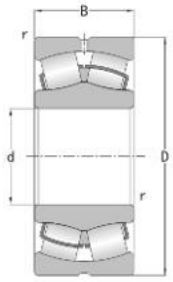

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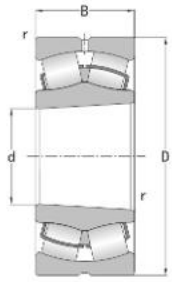
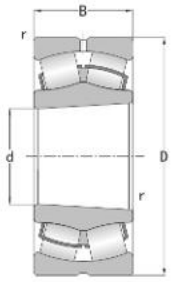


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
340	580	243	5	3800	8250	24138CC	24138CCK30	600	400	362	558	4	268
	620	165	6	2650	5050	22268CA	22268CAK	700	500	368	592	5	225
	620	165	6	2650	5050	22268MB	22268MBK	700	500	368	592	5	226
	620	165	6	2650	5050	22268CC	22268CCK	700	500	368	592	5	223
	620	224	6	3850	7700	23268CA	23268CAK	570	380	368	592	5	300
	620	224	6	3850	7700	23268MB	23268MBK	570	380	368	592	5	300
	620	224	6	3850	7700	23268CC	23268CCK	570	380	368	592	5	297
	710	212	7.5	4350	7820	22368CA	22368CAK	550	400	410	640	6	411
	710	212	7.5	4350	7820	22368MB	22368MBK	550	400	410	640	6	409
360	440	60	2.1	710	1650	23872CA	23872CAK	1300	1050	372	428	2	19.2
	480	90	3	1300	2900	23972CA	23972CAK	1100	850	374	466	2.5	46.6
	480	90	3	1300	2900	23972MB	23972MBK	1100	850	374	466	2.5	46.6
	480	90	3	1300	2900	23972CC	23972CCK	1100	850	374	466	2.5	46.1
	540	134	5	2280	4800	23072CA	23072CAK	850	670	382	518	4	110
	540	134	5	2280	4800	23072MB	23072MBK	850	670	382	518	4	110
	540	134	5	2280	4800	23072CC	23072CCK	850	670	382	518	4	108
	540	180	5	2700	6150	24072CA	24072CAK30	800	630	382	518	4	147
	540	180	5	2700	6150	24072MB	24072MBK30	800	630	382	518	4	149
	540	180	5	2700	6150	24072CC	24072CCK30	800	630	382	518	4	143
	600	192	5	3250	6850	23172CA	23172CAK	700	560	382	578	4	254
	600	192	5	3250	6850	23172MB	23172MBK	700	560	382	578	4	255
	600	192	5	3250	6850	23172CC	23172CCK	700	560	382	578	4	254
	600	243	5	4300	8700	24172CA	24172CAK30	500	400	382	578	4	270
	600	243	5	4300	8700	24172MB	24172MBK30	500	400	382	578	4	270
	600	243	5	4300	8700	24172CC	24172CCK30	550	450	382	578	4	269
	650	170	6	3150	5850	22272CA	22272CAK	550	450	388	622	5	271
	650	170	6	3150	5850	22272MB	22272MBK	550	450	388	622	5	271
	650	232	6	4250	8300	23272CA	23272CAK	500	400	388	622	5	330
	650	232	6	4250	8300	23272MB	23272MBK	500	400	388	622	5	330
	750	224	7.5	4900	8600	22372CA	22372CAK	450	350	392	720	6	466

Spherical Roller Bearing



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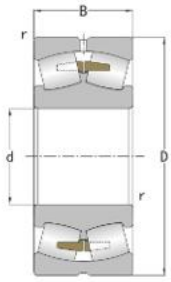

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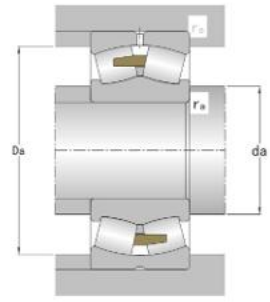
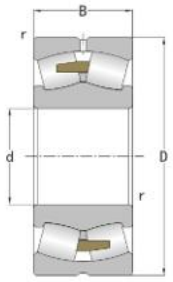
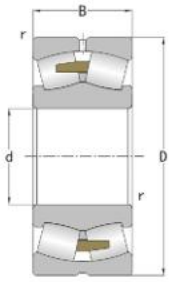


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
360	750	224	7.5	4900	8600	22372MB	22372MBK	450	350	392	720	6	466
380	520	106	4	1500	3300	23976CA	23976CAK	1000	800	398	502	3	69.5
	520	106	4	1500	3300	23976MB	23976MBK	1000	800	398	502	3	69.5
	520	106	4	1500	3300	23976CC	23976CCK	1000	800	398	502	3	69.1
	560	135	5	2450	5050	23076CA	23076CAK	800	630	402	538	4	116
	560	135	5	2450	5050	23076MB	23076MBK	800	630	402	538	4	116
	560	135	5	2450	5050	23076CC	23076CCK	800	630	402	538	4	113
	560	180	5	3100	6700	24076CA	24076CAK30	600	480	402	538	4	153
	560	180	5	3100	6700	24076MB	24076MBK30	600	480	402	538	4	153
	560	180	5	3100	6700	24076CC	24076CCK30	600	480	402	538	4	152
	620	194	5	3400	7350	23176CA	23176CAK	500	400	402	598	4	244
	620	194	5	3400	7350	23176MB	23176MBK	500	400	402	598	4	242
	620	194	5	3400	7350	23176CC	23176CCK	500	400	402	598	4	243
	620	243	5	4800	9650	24176CA	24176CAK30	500	400	402	598	4	296
	620	243	5	4800	9650	24176MB	24176MBK30	500	400	402	598	4	294
	620	243	5	4800	9650	24176CC	24176CCK30	500	400	402	598	4	293
	680	175	6	3850	6500	22276CA	22276CAK	500	400	408	652	5	280
	680	175	6	3850	6500	22276MB	22276MBK	500	400	408	652	5	280
	680	240	6	5200	9500	23276CA	23276CAK	480	380	408	652	5	380
	680	240	6	5200	9500	23276MB	23276MBK	480	380	408	652	5	380
	780	230	7.5	5500	9000	22376CA	22376CAK	450	350	425	745	6	545
	780	230	7.5	5500	9000	22376MB	22376MBK	450	350	425	745	6	545
400	500	100	2.1	1200	3300	24880CA	24880CAK30	1000	820	412	488	2	44.1
	540	106	4	1550	3650	23980CA	23980CAK	950	750	418	522	3	72.4
	540	106	4	1550	3650	23980MB	23980MBK	950	750	418	522	3	72.4
	540	106	4	1550	3650	23980CC	23980CCK	950	750	418	522	3	70.2
	600	148	5	2550	5650	23080CA	23080CAK	750	600	422	578	4	150
	600	148	5	2550	5650	23080MB	23080MBK	750	600	422	578	4	150
	600	148	5	2550	5650	23080CC	23080CCK	750	600	422	578	4	147

Spherical Roller Bearing



CA/W33



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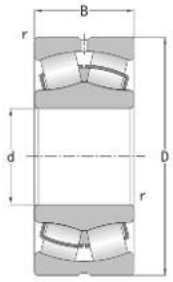

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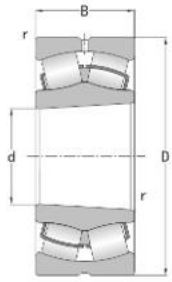
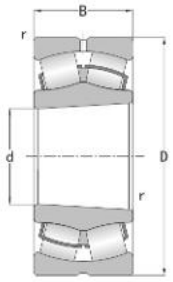


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
400	600	200	5	3300	7800	24080CA	24080CAK30	560	450	422	578	4	202
	600	200	5	3300	7800	24080MB	24080MBK30	560	450	422	578	4	202
	600	200	5	3300	7800	24080CC	24080CCK30	560	450	422	578	4	200
	650	200	6	3600	7650	23180CA	23180CAK	480	380	428	622	5	275
	650	200	6	3600	7650	23180MB	23180MBK	480	380	428	622	5	275
	650	200	6	3600	7650	23180CC	23180CCK	480	380	428	622	5	275
	650	250	6	5100	10300	24180CA	24180CAK30	480	380	428	622	5	329
	650	250	6	5100	10300	24180MB	24180MBK30	480	380	428	622	5	328
	650	250	6	5100	10300	24180CC	24180CCK30	480	380	428	622	5	326
	720	185	6	4400	7400	22280CA	22280CAK	480	380	428	692	5	337
	720	185	6	4400	7400	22280MB	22280MBK	480	380	428	692	5	337
	720	256	6	5550	11000	23280CA	23280CAK	430	340	428	692	5	353
	720	256	6	5550	11000	23280MB	23280MBK	430	340	428	692	5	353
	820	243	7.5	6820	9500	22380CA	22380CAK	450	350	442	790	6	640
	820	243	7.5	6820	9500	22380MB	22380MBK	450	350	442	790	6	640
420	520	75	2.1	1000	2550	23884CA	23884CAK	950	700	432	508	2	34.8
	560	106	4	1620	3800	23984CA	23984CAK	800	600	438	542	3	71.6
	560	106	4	1620	3800	23984MB	23984MBK	800	600	438	542	3	71.6
	620	150	5	2700	6400	23084CA	23084CAK	560	450	442	598	4	149
	620	150	5	2700	6400	23084MB	23084MBK	560	450	442	598	4	149
	620	150	5	2700	6400	23084CC	23084CCK	560	450	442	598	4	148
	620	200	5	3550	8450	24084CA	24084CAK30	480	380	442	598	4	202
	620	200	5	3550	8450	24084MB	24084MBK30	480	380	442	598	4	202
	700	224	6	4250	9200	23184CA	23184CAK	450	360	448	672	5	351
	700	224	6	4250	9200	23184MB	23184MBK	450	360	448	672	5	353
	700	224	6	4250	9200	23184CC	23184CCK	450	360	448	672	5	352
	700	280	6	5300	11900	24184CA	24184CAK30	450	340	448	672	5	421
	700	280	6	5300	11900	24184MB	24184MBK30	450	340	448	672	5	421
	760	272	7.5	5800	12100	23284CA	23284CAK	400	320	456	724	6	550
	760	272	7.5	5800	12100	23284MB	23284MBK	400	320	456	724	6	550

Spherical Roller Bearing



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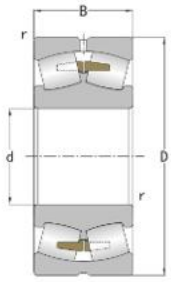

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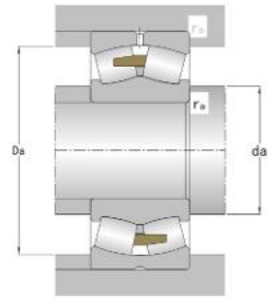
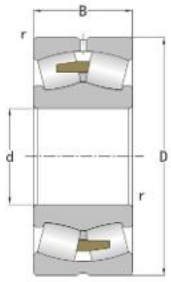
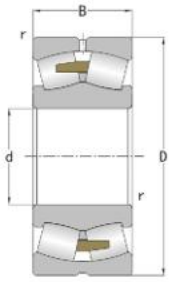


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
440	600	118	4	2000	4800	23988CA	23988CAK	680	500	458	582	3	96.3
	600	118	4	2000	4800	23988MB	23988MBK	680	500	458	582	3	96.3
	650	157	6	2850	6500	23088CA	23088CAK	530	430	468	622	5	185
	650	157	6	2850	6500	23088MB	23088MBK	530	430	468	622	5	185
	650	212	6	3850	9200	24088CA	24088CAK30	420	330	468	622	5	237
	650	212	6	3850	9200	24088MB	24088MBK30	420	330	468	622	5	237
	720	226	6	4500	10000	23188CA	23188CAK	430	340	468	692	5	378
	720	226	6	4500	10000	23188MB	23188MBK	430	340	468	692	5	378
	720	280	6	6000	12000	24188CA	24188CAK30	430	320	468	692	5	433
	720	280	6	6000	12000	24188MB	24188MBK30	430	320	468	692	5	433
	790	280	7.5	6500	12800	23288CA	23288CAK	400	300	476	754	6	594
	790	280	7.5	6500	12800	23288MB	23288MBK	400	300	476	754	6	594
460	580	118	3	1780	4650	24892CA	24892CAK30	650	550	474	566	2.5	81.8
	620	118	4	2050	4950	23992CA	23992CAK	530	430	478	602	3	100
	620	118	4	2050	4950	23992MB	23992MBK	530	430	478	602	3	100
	680	163	6	3380	7100	23092CA	23092CAK	500	400	488	652	5	226
	680	163	6	3380	7100	23092MB	23092MBK	500	400	488	652	5	226
	680	218	6	4200	9500	24092CA	24092CAK30	400	320	488	652	5	277
	680	218	6	4200	9500	24092MB	24092MBK30	400	320	488	652	5	277
	760	240	7.5	4950	11000	23192CA	23192CAK	400	320	496	724	6	457
	760	240	7.5	4950	11000	23192MB	23192MBK	400	320	496	724	6	455
	760	300	7.5	6100	14400	24192CA	24192CAK30	400	300	496	724	6	588
	760	300	7.5	6100	14400	24192MB	24192MBK30	400	300	496	724	6	588
	830	296	7.5	6750	13500	23292CA	23292CAK	380	300	496	794	6	698
	830	296	7.5	6750	13500	23292MB	23292MBK	380	300	496	794	6	698
480	600	90	3	1280	4050	23896CA	23896CAK	600	450	500	580	3	61.2
	650	128	5	2150	5500	23996CA	23996CAK	500	400	502	628	4	125
	650	128	5	2150	5500	23996MB	23996MBK	500	400	502	628	4	125
	700	165	6	3450	7250	23096CA	23096CAK	480	400	508	672	5	218

Spherical Roller Bearing



CA/W33



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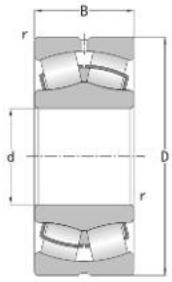

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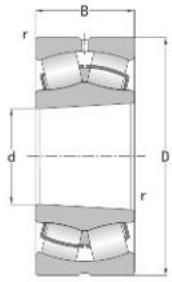
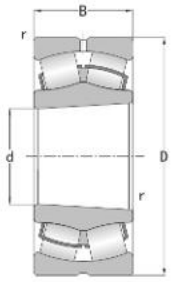


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
480	700	165	6	3450	7250	23096MB	23096MBK	480	400	508	672	5	218
	700	218	6	4300	9800	24096CA	24096CAK30	400	320	508	672	5	288
	700	218	6	4300	9800	24096MB	24096MBK30	400	320	508	672	5	288
	790	248	7.5	5800	12000	23196CA	23196CAK	380	300	516	754	6	516
	790	248	7.5	5800	12000	23196MB	23196MBK	380	300	516	754	6	516
	790	308	7.5	6850	14600	24196CA	24196CAK30	380	300	516	754	6	616
	790	308	7.5	6850	14600	24196MB	24196MBK30	380	300	516	754	6	616
	870	310	7.5	7350	15200	23296CA	23296CAK	340	260	516	834	6	815
	870	310	7.5	7350	15200	23296MB	23296MBK	340	260	516	834	6	815
500	620	90	3	1500	3800	238500CA	238500CAK30	600	500	514	606	2.5	66.1
	620	108	3	1850	5450	248500CA	248500CAK30	550	450	514	606	2.5	73.6
	620	118	3	1950	5500	248500CA	248500CAK30	550	450	514	606	2.5	80.6
	670	128	5	2300	6000	239500CA	239500CAK	500	400	522	648	4	120
	670	128	5	2300	6000	239500MB	239500MBK	500	400	522	648	4	120
	720	167	6	3500	7650	230500CA	230500CAK	480	380	528	692	5	228
	720	167	6	3500	7650	230500MB	230500MBK	480	380	528	692	5	228
	720	218	6	4600	10200	240500CA	240500CAK30	400	300	528	692	5	298
	830	264	7.5	6150	13400	231500CA	231500CAK	360	280	536	794	6	567
	830	264	7.5	6150	13400	231500MB	231500MBK	360	280	536	794	6	567
	830	325	7.5	7100	16000	241500CA	241500CAK30	360	260	536	794	6	725
	830	325	7.5	7100	16000	241500MB	241500MBK30	360	260	536	794	6	722
	920	336	7.5	8600	18600	232500CA	232500CAK	340	260	536	884	6	985
	920	336	7.5	8600	18600	232500MB	232500MBK	340	260	536	884	6	985
520	820	280	7.5	7650	18500	206520CA	206520CAK	340	260	531	820	6	555
530	650	90	3	1500	4200	238530CA	238530CAK	500	400	552	652	2.5	64.5
	650	118	3	1800	5300	248530CA	248530CAK30	450	350	543	636	2.5	89.5
	710	136	5	2500	6500	239530CA	239530CAK	450	360	552	688	4	149
	710	136	5	2500	6500	239530MB	239530MBK	450	360	552	688	4	149

Spherical Roller Bearing



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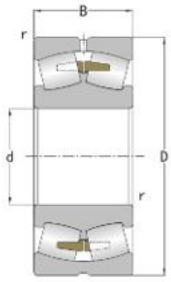

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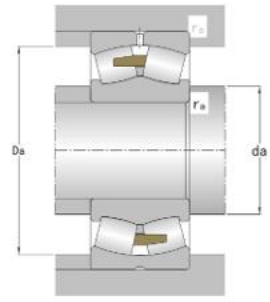
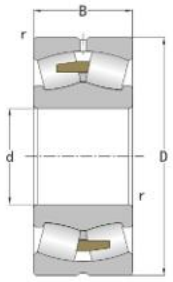


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
530	780	185	6	3900	9000	230530CA	230530CAK	430	340	558	752	5	339
	780	185	6	3900	9000	230530MB	230530MBK	430	340	558	752	5	339
	780	250	6	5400	11800	240530CA	240530CAK30	350	250	558	752	5	415
	870	272	7.5	6800	14000	231530CA	231530CAK	340	260	566	834	6	628
	870	272	7.5	6800	14000	231530MB	231530MBK	340	260	566	834	6	628
	870	335	7.5	7500	17500	241530CA	241530CAK30	340	260	566	834	6	805
	870	335	7.5	7500	17500	241530MB	241530MBK30	340	260	566	834	6	803
	980	355	9.5	10100	18800	232530CA	232530CAK	300	240	574	936	8	1170
	980	355	9.5	10100	18800	232530MB	232530MBK	300	240	574	936	8	1170
560	680	90		1500	4250	238560CA	238560CAK	500	400	574	666	2.5	65.8
	750	140		2850	6800	239560CA	239560CAK	430	340	582	728	4	177
	750	140		2850	6800	239560MB	239560MBK	430	340	582	728	4	177
	820	195		4300	10500	230560CA	230560CAK	410	320	588	792	5	363
	820	195		4300	10500	230560MB	230560MBK	410	320	588	792	5	363
	820	258		5950	13300	240560CA	240560CAK30	350	250	588	792	5	465
	920	280		6900	15700	231560CA	231560CAK	320	240	596	884	6	756
	920	280		6900	15700	231560MB	231560MBK	320	240	596	884	6	756
	920	355		8800	19600	241560CA	241560CAK30	320	240	596	884	6	890
	920	355		8800	19600	241560MB	241560MBK30	320	240	596	884	6	886
	1030	365		10900	20500	232560CA	232560CAK	280	220	604	986	8	1320
	1030	365		10900	20500	232560MB	232560MBK	280	220	604	986	8	1320
600	800	150		3100	7600	239600CA	239600CAK	400	320	622	778	4	215
	800	150		3100	7600	239600MB	239600MBK	400	320	622	778	4	215
	800	200		4000	11000	249600CA	249600CAK30	400	300	622	760	4	290
	870	200		4700	11600	230600CA	230600CAK	380	300	628	842	5	442
	870	200		4700	11600	230600MB	230600MBK	380	300	628	842	5	442
	870	272		6600	15100	240600CA	240600CAK30	320	240	628	842	5	532
	980	300		8450	17800	231600CA	231600CAK	300	220	636	944	6	908
	980	300		8450	17800	231600MB	231600MBK	300	220	636	944	6	908

Spherical Roller Bearing



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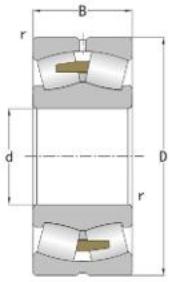

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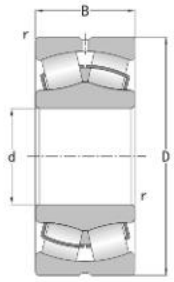

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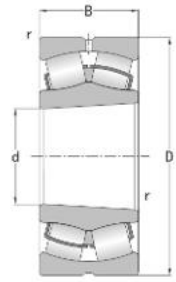
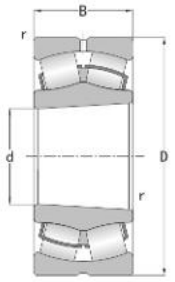


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
600	980	375	7.5	9400	21600	241600CA	241600CA	300	220	636	944	6	1140
	980	375	7.5	9400	21600	241600MB	241600MB	300	220	636	944	6	1140
	1090	388	9.5	12700	24900	232600CA	232600CA	260	200	700	1000	8	1550
	1090	388	9.5	12700	24900	232600MB	232600MB	260	200	700	1000	8	1550
630	780	112	4	2050	6150	238630CA	238630CA	420	350	645	765	3	125
	780	150	4	2900	8600	248630CA	248630CA	350	280	648	762	3	160
	850	165	6	4000	9350	239630CA	239630CA	360	300	658	822	5	270
	850	165	6	4000	9350	239630MB	239630MB	360	300	658	822	5	270
	920	212	7.5	5150	12800	230630CA	230630CA	340	260	666	884	6	472
	920	212	7.5	5150	12800	230630MB	230630MB	340	260	666	884	6	472
	920	290	7.5	7550	17700	240630CA	240630CA	300	220	666	884	6	655
	1030	315	7.5	9000	19000	231630CA	231630CA	260	200	666	994	6	1050
	1030	400	7.5	10500	23580	241630CA	241630CA	260	200	666	994	6	1325
	1150	412	12	13400	25600	232630CA	232630CA	240	180	684	1096	10	1850
	1150	412	12	13400	25600	232630MB	232630MB	240	180	684	1096	10	1850
670	820	112	4	2050	6150	238670CA	238670CA	320	250	686	805	3	135
	820	150	4	3080	9500	248670CA	248670CA	310	250	686	805	3	176
	900	170	6	4350	10300	239670CA	239670CA	340	260	698	872	5	314
	900	170	6	4350	10300	239670MB	239670MB	340	260	698	872	5	314
	900	170	6	4350	10300	239670CC	239670CC	340	260	698	872	5	311
	980	230	7.5	5730	14200	230670CA	230670CA	320	240	706	944	6	601
	980	230	7.5	5730	14200	230670MB	230670MB	320	240	706	944	6	601
	980	308	7.5	8450	19500	240670CA	240670CA	260	200	706	944	6	773
	1090	336	7.5	10400	20850	231670CA	231670CA	240	180	706	1054	6	1250
	1090	412	7.5	11500	26500	241670CA	241670CA	240	180	706	1054	6	1525
	1220	438	12	14900	28700	232670CA	232670CA	220	170	724	1166	10	2210
700	1020	250	7.5	13500	27800	206700CA	206700CA	240	180	780	965	6	690

Spherical Roller Bearing



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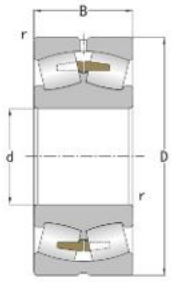

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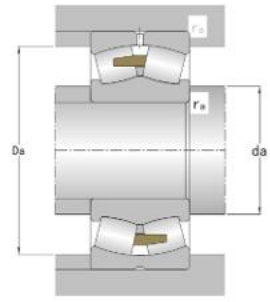
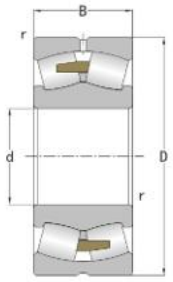


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
710	870	118	4	2650	7500	238710CA	238710CAK	350	250	725	855	3	155
	950	180	6	4800	11700	239710CA	239710CAK	300	240	738	922	5	372
	950	180	6	4800	11700	239710MB	239710MBK	300	240	738	922	5	372
	950	243	6	6000	16000	249710CC	249710CCK	270	200	738	922	5	498
	1030	236	7.5	7100	15800	230710CA	230710CAK	280	240	746	994	6	660
	1030	315	7.5	9050	20500	240710CA	240710CAK30	240	180	746	994	6	880
	1150	345	7.5	11000	22850	231710CA	231710CAK	225	170	754	1106	8	1460
	1150	438	9.5	12580	29800	241710CA	241710CAK30	225	170	754	1106	8	1800
	1280	450	12	15700	30500	232710CA	232710CAK	200	160	764	1226	10	2420
750	920	128	5	2880	8200	238750CA	238750CAK	300	240	772	898	4	180
	920	170	5	3500	10200	248750CA	248750CAK30	300	220	772	898	4	250
	1000	185	6	5250	12800	239750CA	239750CAK	280	220	778	972	5	422
	1000	185	6	5250	12800	239750MB	239750MBK	280	220	778	972	5	422
	1000	250	6	7450	17800	249750CA	249750CAK	260	200	778	972	5	568
	1090	250	7.5	7250	17900	230750CA	230750CAK	280	200	786	1054	6	789
	1090	335	7.5	9800	22500	240750CA	240750CAK30	280	200	786	1054	6	1050
	1220	365	9.5	11800	25900	231750CA	231750CAK	200	150	794	1176	8	1750
	1220	475	9.5	14500	35000	241750CA	241750CAK30	200	150	794	1176	8	2180
	1360	475	15	17700	35500	232750CA	232750CAK	180	130	814	1296	12	2980
800	980	180	5	4000	11500	248800CA	248800CAK03	280	210	820	962	4	328
	1060	195	6	5350	13200	239800CA	239800CAK	260	200	828	1032	5	490
	1060	195	6	5350	13200	239800MB	239800MBK	260	200	828	1032	5	490
	1060	258	6	7650	18500	249800CA	249800CAK30	240	180	828	1032	5	636
	1150	258	7.5	8350	19100	230800CA	230800CAK	220	170	836	1114	6	870
	1150	345	7.5	10000	25000	240800CA	240800CAK	220	170	836	1114	6	1150
	1280	375	9.5	12800	26500	231800CA	231800CAK	185	140	844	1236	8	1890
	1280	475	9.5	16000	36500	241800CA	241800CAK30	170	130	844	1236	8	2340
	1420	488	15	18800	41050	232800CA	232800CAK	160	115	840	1360	12	

Spherical Roller Bearing



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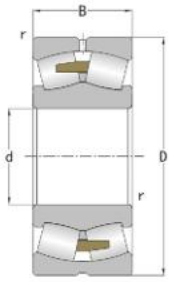

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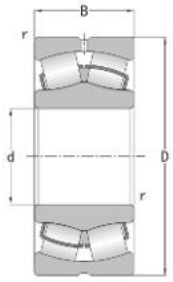

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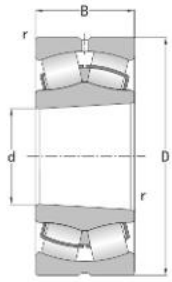
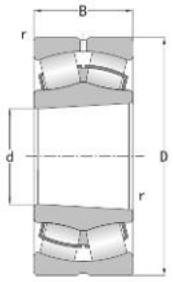


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
850	1030	136	5	3350	9500	238850CA	238850CAK	250	180	872	1000	4	235
	1120	200	6	6100	15200	239850CA	239850CAK	250	180	878	1092	5	560
	1120	272	6	8000	20500	249850CA	249850CAK30	220	170	878	1092	5	745
	1220	272	7.5	8450	22500	230850CA	230850CAK	240	180	886	1184	6	1074
	1220	365	7.5	11050	23800	240850CA	240850CAK30	225	180	886	1184	6	1410
	1360	400	12	14000	31000	231850CA	231850CAK	170	130	904	1306	10	2270
	1360	500	12	18000	42500	241850CA	241850CAK30	140	105	904	1306	10	2740
	1500	515	15	20000	45000	232850CA	232850CAK	150	100	914	1436	12	3900
884	1320	365	7.5	12200	28000	206884CA	206884CAK	150	110	936	1258	6	1800
900	1090	190	5	4800	15000	248900CA	248900CAK30	350	200	918	1073	4	365
	1180	206	6	6250	15500	239900CA	239900CAK	240	180	928	1152	5	625
	1250	250	6	7050	18800	239900MB	239900MBK	240	180	928	1220	5	935
	1270	365	7.5	10500	27500	240900CA	240900CAK30	210	160	936	1236	6	1430
	1280	280	7.5	9500	22200	230900CA	230900CAK	210	160	936	1244	6	1175
	1280	375	7.5	11500	31500	240900CA	240900CAK30	210	160	936	1244	6	1570
	1320	365	7.5	10000	26200	240900MB	240900MBK30	170	130	940	1282	6	1720
	1420	412	12	15500	36500	231900CA	231900CAK	165	125	954	1366	10	2500
	1420	515	12	20000	47000	241900CA	241900CAK30	140	95	954	1366	10	3350
	1580	515	15	22000	49000	232900CA	232900CAK	150	100	965	1530	12	4420
950	1250	224	7.5	7600	19900	239950CA	239950CAK	220	160	986	1214	6	772
	1250	300	7.5	9100	26000	249950CA	249950CAK30	180	135	986	1214	6	1025
	1360	300	7.5	10500	21000	230950CA	230950CAK	210	160	986	1324	6	1435
	1360	412	7.5	14000	38500	240950CA	240950CAK30	200	160	986	1324	6	1992
	1500	545	12	22000	55000	241950CA	241950CAK30	135	100	998	1452	10	3600
	1660	530	15	25000	56500	232950CA	232950CAK	130	90	1075	1600	12	5000
1000	1220	165	6	4500	13500	2381000CA	2381000CAK	160	125	972	1260	5	400
	1320	236	7.5	8100	20500	2391000CA	2391000CAK	150	120	1036	1284	6	920

Spherical Roller Bearing



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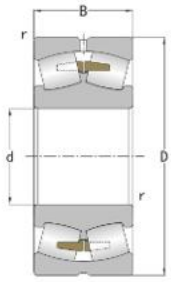

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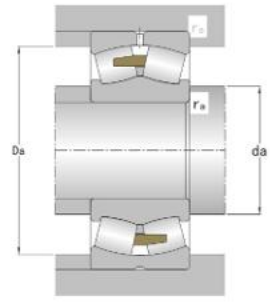
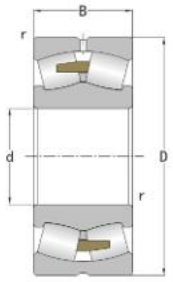


Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
1000	1320	315	7.5	10000	28500	2491000CA	2491000CAK30	140	115	1036	1284	6	1220
	1420	308	7.5	11900	28100	2301000CA	2301000CAK	130	100	1036	1384	6	1580
	1420	412	7.5	14500	38500	2401000CA	2401000CAK30	130	100	1036	1384	6	2128
	1580	462	12	20500	40000	2311000CA	2311000CAK	130	95	1048	1532	10	3420
	1580	580	12	25000	61000	2411000CA	2411000CAK30	130	95	1048	1532	10	4350
1060	1280	165	6	4700	14500	2381060CA	2381060CAK	150	120	1082	1258	5	440
	1280	218	6	5850	18500	2481060CA	2481060CAK30	150	120	1082	1258	5	575
	1400	250	7.5	9300	24400	2391060CA	2391060CAK	140	115	1096	1384	6	1080
	1400	335	7.5	10500	32000	2491060CA	2491060CAK30	140	115	1096	1384	6	1388
	1500	325	9.5	12800	31500	2301060CA	2301060CAK	140	110	1104	1456	8	1840
	1500	438	9.5	15500	41500	2401060CA	2401060CAK30	140	110	1104	1456	8	2515
1120	1360	180	6	5850	16500	2381120CA	2381120CAK	150	105	1148	1332	5	538
	1360	243	6	7150	24000	2481120CA	2481120CAK30	150	105	1148	1332	5	740
	1460	335	7.5	12000	35000	2491120CA	2491120CAK30	130	100	1146	1431	6	1500
	1580	345	9.5	13500	33500	2301120CA	2301120CAK	150	120	1164	1536	8	2190
	1580	462	9.5	17500	50000	2401120CA	2401120CAK30	150	120	1164	1536	8	2930
1180	1420	180	6	6000	16750	2381180CA	2381180CAK	150	100	1208	1392	5	570
	1420	243	6	7600	26000	2481180CA	2481180CAK30	150	100	1208	1392	5	790
	1540	272	7.5	9350	29600	2391180CA	2391180CAK	150	110	1216	1504	6	1350
	1540	355	7.5	12500	38500	2491180CA	2491180CAK30	150	110	1216	1504	6	1775
	1660	355	9.5	11000	29800	2301180CA	2301180CAK	150	110	1240	1600	6	2458
	1660	475	9.5	18500	52500	2401180CA	2401180CAK30	140	100	1240	1600	8	3260
1250	1630	280	7.5	10500	31500	2391250CA	2391250CAK	140	100	1286	1594	6	1605
	1750	375	9.5	16500	45000	2301250CA	2301250CAK	125	90	1285	1715	8	2850
	1750	500	9.5	20500	55500	2401250CA	2401250CAK30	125	90	1285	1715	8	3800
1300	1560	150	7.5	10800	30500	2061300CA	2061300CAK	140	100	1300	1500	6	554

Spherical Roller Bearing



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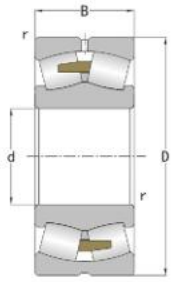

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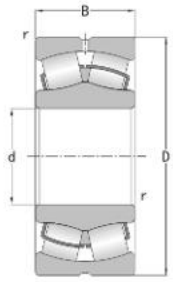

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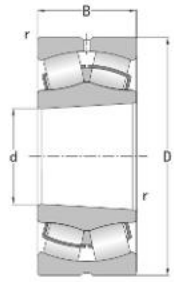
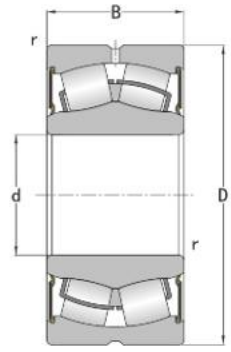


CCK/W33

Boundary Dimensions (mm)				Load Ratings (KN)		Bearing Code		Limiting Speeds (r/min)		Mounting Dimensions (mm)			Mass (kg)
d	D	B	rsmin	Cr	Cor	Cylindrical Bore	Tapered Bore	Oil	Grease	da min	Da max	ra max	
d	D	B	rsmin	Cr	Cor			Oil	Grease	min	max	max	
1320	1600	280	6	9500	32500	2481320CA	2481320CAK30	120	85	1342	1578	5	1180
	1720	300	7.5	12500	36500	2391320CA	2391320CAK	120	85	1356	1684	6	1900
	1720	400	7.5	15500	48500	2491320CA	2491320CAK30	105	80	1356	1684	6	2510
	1850	530	12	23000	23000	2401320CA	2401320CAK30	90	75	1374	1796	10	4540
1400	1820	315	9.5	13500	13500	2391400CA	2391400CAK	110	75	1444	1776	8	2170
	1820	425	9.5	20000	20000	2491400CA	2491400CAK30	90	70	1444	1776	8	2920
	1950	545	12	26500	26500	2401400CA	2401400CAK30	90	75	1500	1850	10	5100
1500	1820	315	7.5	10500	10500	2481500CA	2481500CAK30	90	70	1536	1784	6	1700
1800	2180	375	9.5	15300	15300	2481800CA	2481800CAK30	85	60	1844	2136	8	2865

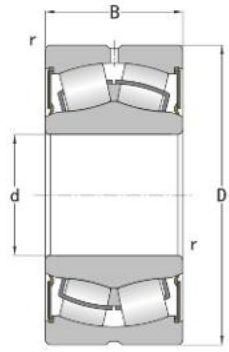
Sealde Spherical Rolle Bearing



Sealed Design

Bearing Code	Boundary dimensions (mm)				Limiting speeds (r/min)	load ratings (KN)		Mass (kg)
	d	D	B	rsmin		Cr	Cor	
BS2-2205-2CS	25	52	23	1	3600	49	44	0.26
BS2-2206-2CS	30	62	25	1	2800	64	60	0.34
BS2-2207-2CS	35	72	28	1.1	2400	86.5	85	0.52
BS2-2208-2CS	40	80	28	1.1	2200	96.5	90	0.57
BS2-2209-2CS	45	85	28	1.1	2000	102	98	0.66
BS2-2210-2CS	50	90	28	1.1	1900	104	108	0.70
BS2-2211-2CS	55	100	31	1.5	1700	125	127	1.00
BS2-2212-2CS	60	110	34	1.5	1600	156	166	1.31
BS2-2213-2CS	65	120	38	1.5	1500	193	216	1.60
BS2-2214-2CS	70	125	38	1.5	1400	208	228	1.80
BS2-2215-2CS	75	130	38	1.5	1300	212	240	2.10
BS2-2216-2CS	80	140	40	2	1200	236	270	2.40
BS2-2217-2CS	85	150	44	2	1100	285	325	3.00
BS2-2218-2CS	90	160	48	2	1000	325	375	3.70
BS2-2220-2CS	100	180	55	2.1	900	425	490	5.50
BS2-2222-2CS	110	200	63	2.1	800	560	640	7.60
BS2-2224-2CS	120	215	69	2.1	750	630	765	9.75
BS2-2208-2CS	40	90	33	1.5	1900	150	150	1.20
BS2-2209-2CS	45	100	42	1.5	1500	183	183	1.60
BS2-2210-2CS	50	110	45	2	1400	220	224	2.10
BS2-2211-2CS	55	120	49	2	1400	270	280	2.80
BS2-2212-2CS	60	130	53	2.1	1100	310	335	3.40
BS2-2213-2CS	65	140	53	2.1	1000	340	360	4.15
BS2-2214-2CS	70	150	60	2.1	900	400	430	5.10

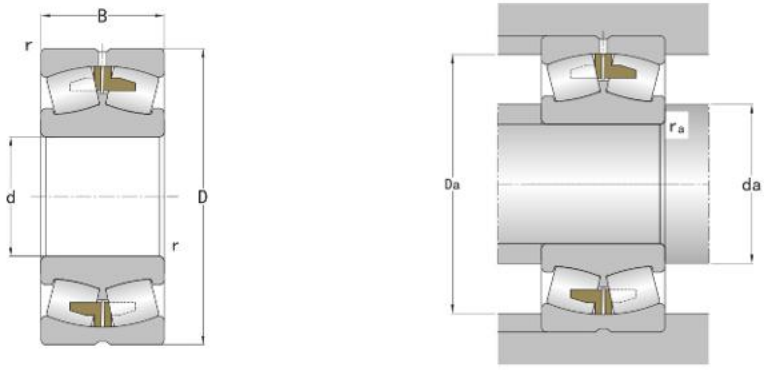
Sealde Spherical Rolle Bearing



Sealed Design

Bearing Code	Boundary dimensions (mm)				Limiting speeds (r/min)	load ratings (KN)		Mass (kg)
	d	D	B	rsmin		Cr	Cor	
BS2–2215–2CS	75	160	64	2.1	950	440	475	6.50
BS2–2216–2CS	80	170	67	2.1	800	490	540	7.20
22324–2CS	120	260	86	3	600	980	1120	23.00
23022–2CS	110	170	45	2	900	310	440	3.80
23024–2CS	120	180	46	2	850	355	510	4.20
23120–2CS	100	165	52	2	850	365	490	4.40
23122–2CS	110	180	56	2	800	430	585	5.75
23218–2CS	90	160	52.4	2	750	355	440	4.65
23220–2CS	100	180	60.3	2.1	700	475	600	6.85
23222–2CS	110	200	69.8	2.1	640	600	765	9.85
23224–2CS	120	215	76	2.1	600	695	930	12.00
24015–2CS	75	115	40	1.1	950	173	232	1.55
24020–2CS	100	150	50	1.5	800	285	415	3.20
24022–2CS	110	170	45	2	670	415	620	5.00
24024–2CS	120	180	60	2	670	430	670	5.45
24120–2CS	100	165	65	2	670	455	640	5.65
24122–2CS	110	180	69	2	630	520	750	7.10
24122–2CS	120	200	80	2	560	655	950	10.50

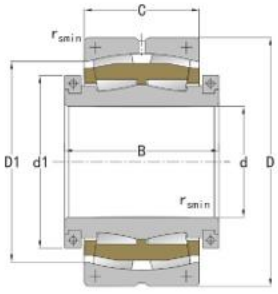
Spherical Rollor Bearing for Vibrating Screen

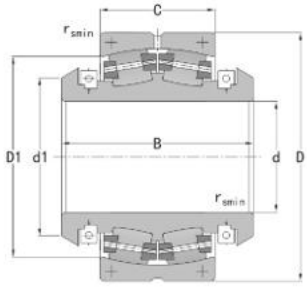


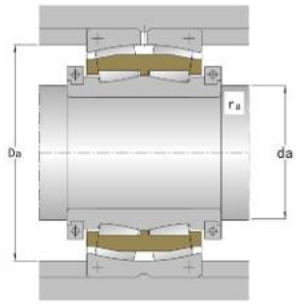
Vibrating Screen Bearing

Boundary dimensions (mm)				load ratings (KN)		Bearing Code	Limiting speeds (r/min)		Mounting dimensions (mm)			Mass (kg)
									da	Da	ra	
d	D	B	rsmin	Cr	Cor	22308EMA	Grease	Oil	min	max	max	
40	90	33	1.5	127	146	22309EMA	4300	5300	52	78	1.5	1.044
45	100	36	1.5	153	179	22310EMA	3900	4800	56	91	1.5	1.44
50	110	40	2.0	195	226	22311EMA	3600	4500	60	100	2.1	1.927
55	120	43	2.0	226	268	22312EMA	3200	4000	65	110	2.1	2.461
60	130	46	2.1	262	313	22313EMA	3000	3800	72	118	2.1	3.088
65	140	48	2.1	285	340	22314EMA	2600	3400	77	128	2.1	3.705
70	150	51	2.1	330	420	22315EMA	2600	3200	82	138	2.1	4.501
75	160	55	2.1	380	475	22316EMA	2300	3000	87	148	2.1	5.552
80	170	58	2.1	420	535	22317EMA	2100	2800	92	158	2.1	6.537
85	180	60	3.0	462	571	22318EMA	2000	2600	99	166	2.5	7.542
90	190	64	3.0	518	677	22319EMA	1900	2400	104	176	2.5	9.056
95	200	67	3.0	568	744	22320EMA	1900	2300	109	186	2.5	10.43
100	215	73	3.0	659	875	22321EMA	1700	2100	114	201	2.5	13.34
110	240	80	3.0	795	1020	22322EMA	1500	1900	124	226	2.5	18.62
120	260	86	3.0	921	1195	22324EMA	1300	1800	134	246	2.5	23.17
130	280	93	4.0	1160	1560	22326EMA	1300	1700	148	262	3.0	28.78
140	300	102	4.0	1230	1700	22328EMA	1200	1600	158	282	3.0	36.18
150	320	108	4.0	1390	1800	22330EMA	1200	1500	168	302	3.0	43.35
160	340	114	4.0	1330	1810	22332EMA	800	1000	178	322	3.0	51.76
170	360	120	4.0	1470	1960	22334EMA	750	950	188	342	3.0	61.39
180	380	126	4.0	1620	2170	22336EMA	700	900	198	362	3.0	71.25
190	400	132	5.0	2000	2400	22338EMA	650	850	208	382	4.0	81.02

Split Spheriacl Roller Bearing



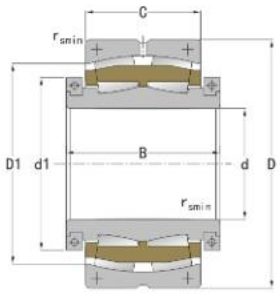


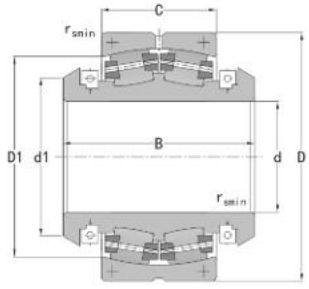


Split Bearing

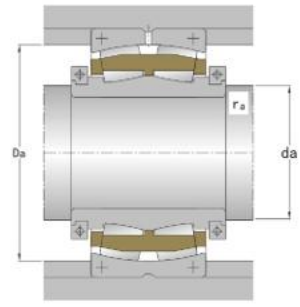
Basic Dimensions (mm)					Basic rated load (KN)		Bearing Code
d	D	B	C	rsmin	Cr	Cor	
mm					KN		
850	1120	390	272	6	7350	20500	249/850D
	1120	455	365	7.5	10900	25800	240/850D
	1120	66	365	7.5	10900	25800	240/850WD
	1120	540	365	7.5	10900	25800	240/850WBD
	1280	540	375	7.5	12200	30600	240/850X3D
884	1320	478	365	9.5	11000	24900	240/884D/HC
900	1180	440	280	6	8100	22600	239/900X2
	1270	478	365	9.5	9800	24600	240/900X3D
	1280	498	375	9.5	9800	24600	240/900X2D/HC
	1320	478	365	9.5	9850	24100	240/900X3D/HCC9-2
	1270	470	365	9.5	9800	24600	240/900X3D-2
	1270	470	365	9.5	9800	24600	240/900X3D-3
950	1250	420	300	7.5	8800	25200	249/950D
	1360	420	300	7.5	9100	21000	230/950D
	1360	640	300	7.5	9100	21000	230/950D-1
1000	1470	530	345	9.5	14400	35900	230/100X3D
	1420	556	412	7.5	13300	34500	240/1000D
1060	1460	500	355	7.5	11400	33000	249/1060X1D
	1500	585	438	9.5	15000	40000	240/1060D
	1500	611.5	438	9.5	15000	40000	240/1060D-1
	1500	575	438	9.5	15000	40000	240/1060D-2
1120	1460	500	335	7.5	11300	33000	249/1120D
	1540	525	355	7.5	14200	43000	240/1120X3D
1180	1540	500	355	7.5	1000	31500	249/1180D
1250	1750	560	375	9.5	19500	48000	230/1250D

Split Spheriacl Roller Bearing





Split Bearing



Other Dimensions (mm)		Calculation Coefficient				Mass (kg)
d1	D1	e	Y1	Y2	Y0	
mm		mm				
1010	1027	0.22	3	4.6	2.8	835
1030	1092	0.27	2.5	3.7	2.5	1650
1030	1092	0.27	2.5	3.7	2.5	1931
1060	1092	0.27	2.5	3.7	2.5	1781
1124	1146	0.26	2.6	3.9	2.5	2380
		0.25	2.7	4	2.6	2457
1059	1085	0.21	3.2	4.8	3.2	1120
1118	1130	0.25	2.7	4	2.6	1970
1118	1130	0.25	2.7	4	2.6	2064
1140	1178	0.24	2.8	4.2	2.8	2050
1118	1130	0.25	2.7	4	2.6	1970
1118	1130	0.25	2.7	4	2.6	1880
1132	1148	0.21	3.2	4.8	3.2	1320
1169	1234	0.2	3.4	5	3.2	1956
1050	1234	0.2	3.4	5	3.2	2338
1271	1338	0.21	3.2	4.8	3.2	3030
1107	1276					2633
1331	1349	0.2	3.4	5	3.2	2476
1164	1349	0.2	3.4	5	3.2	3083
1164	1349	0.2	3.4	5	3.2	3089
1164	1349	0.2	3.4	5	3.2	3354
1331	1349	0.2	3.4	5	3.2	2100
1403	1419	0.2	3.4	5	3.2	2920
1394	1428	0.2	3.4	5	3.2	2254
1562	1607	0.19	3.6	5.3	3.6	3850

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