

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Deep groove ball bearings are non-separable, comparatively rigid radial bearings, their balls are guided in deep radial running grooves. They are characterized by a high radial and axial load carrying capacity and can operate at very high speed. Combined loads are accommodated to an optimum degree - in fact, at higher speeds they are often better suited to transmit thrust loads than the ball thrust bearing. For these reasons and their economical price, it is the most widely used bearing. Deep groove ball bearings are also available with one or two non-rubbing metal shields (Z, ZZ) or rubbing seals (RS, 2RS) made from synthetic rubber. Bearings with two shields or two seals are pre-lubricated with the correct quantity of grease of a lithium base which permits operating temperatures of $-30^{\circ}\text{C} + 120^{\circ}\text{C}$ ($-22^{\circ}\text{F} + 248^{\circ}\text{F}$). Deep groove ball bearings with snap ring groove (N) and snap ring (R) in the outer ring enables a simple and space-saving axial location in the housing.

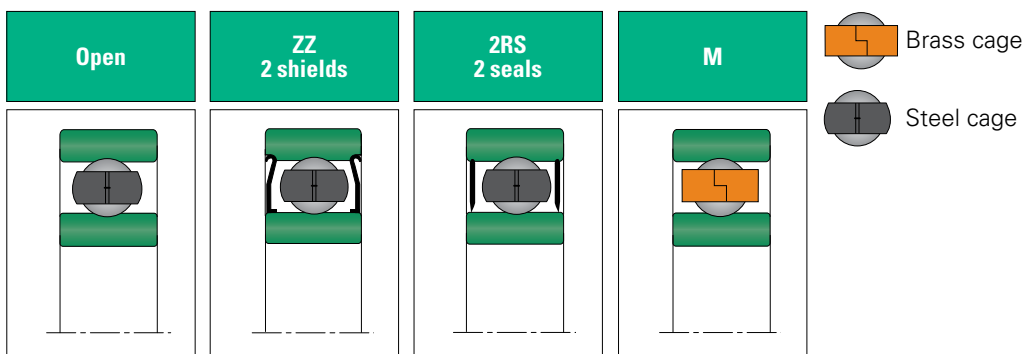


Angular Misalignment

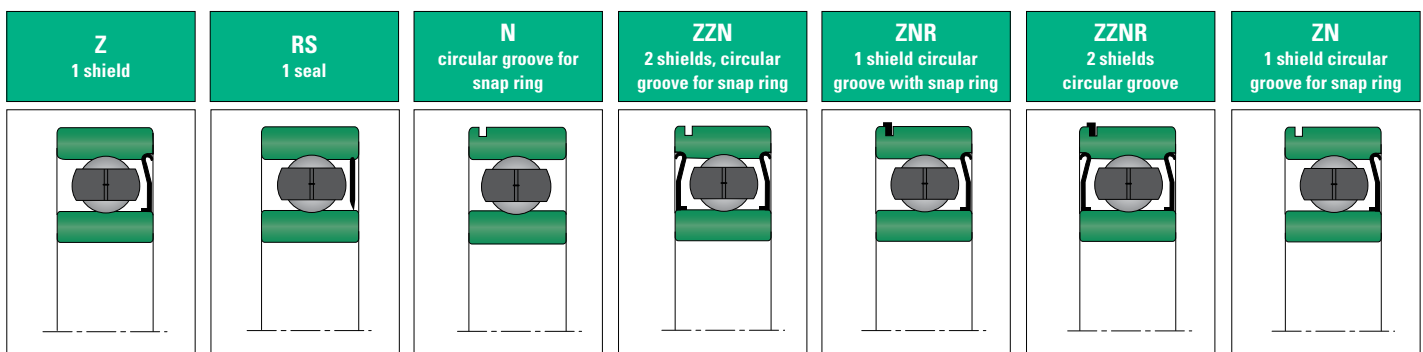
The following is an approximate guide to the misalignment that can be accommodated in the use of a single row ball bearing:

0.0010 radians

A greater degree of misalignment can sometimes be accommodated if pure radial load is applied, particularly if the misalignment results from occasional peak load, and if the bearing had sufficient radial internal clearance after mounting to avoid excessive stresses.



Special versions



Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information



There are single-row and double-row angular contact bearings and also duplex (four point contact bearing). Single-row angular contact ball bearings are non-separable and the standard types feature a contact angle of 40°. They are suitable for the accommodation of combined (radial and axial) loads. Axial loads may be transmitted in the direction of the closed face or high shoulder only.

Optimum load transmission starts with $F_a \geq F_r$. Radial forces induce internal axial forces which are absorbed by the opposed bearing. Such bearings should therefore be mounted in pairs, and should be adjusted against another bearing. In the case of length variations of the shaft caused by changes in temperature, which also affects the internal clearance, the distance between the bearings should be kept small.

The maximum permissible speed is somewhat lower than that of deep groove ball bearings.

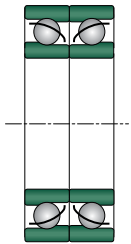
A slight angular deflection is still possible with the single bearing; if bearings are mounted in pairs, however, rigidity greatly increases together with the ability to prevent misalignment.

Single-row angular contact bearings can also be supplied with side faces ground for mounting side-by-side. Suffixes DF, DB, and DT are being used in the bearing designation, ie 7250 BG. They can be mounted in any of three combinations depending on the loading characteristics:

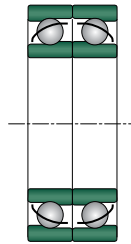
- A back-to-back arrangement (closed face together, load line of the bearings diverging towards the shaft axis) is used where rigidity and an ability to absorb fitting moment is required.
- A face-to-face arrangement (open faces together, load line of the bearings converging on shaft axis) is used where axial loads acting in both directions are to be catered for by one bearing in one direction.

Rigidity is better in the back-to-back arrangement. In the face-to-face arrangement, there is less ability to absorb fitting moments.

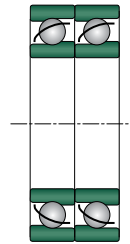
- A tandem arrangement (open face-to-closed-face load lines being parallel to each other) is used for thrust loads equally distributed over all bearings, absorbed in one direction only. Adjustment against another bearing which accommodates the opposed thrust load is necessary.



Back to Back DB



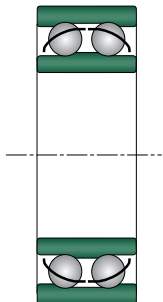
Face to Face DF



Tandem DT

Double Row Angular Contact Bearings

The inner and outer ring of these bearings each have a double raceway, and the two rows of balls have contact angles that are similar to a back-to-back arrangement. Thrust loads can be accommodated in either directions as well as fitting moments.



Face to Face DF

Four Point (Duplex)

The 'four-point' contact bearings, or duplex bearings, are in principle angular contact bearings that accommodate axial loading in both directions. They usually have more axial movement than a pair of angular contact bearings correctly adjusted endwise; they are also able to carry combined radial and axial loading, providing the axial load exceeds the radial load at all times. Duplex bearings should not run unloaded, particularly at high speeds, for in this condition the balls contact the raceways at three or four points instead of two points necessary to correct running. Three or four point contact results in over-heating due to the balls skidding. When duplex bearings are required to carry axial loads only, then the outer rings must have radial clearance in the housing.

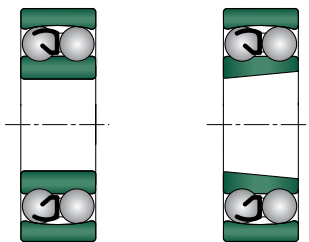
Angular Misalignment

The following is an approximate guide to the misalignment that can be prevalent when fitting angular contact bearings: 0.0003 radians. Greater misalignment, particularly under pure axial load, can become critical.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

This design of bearing utilizes two rows of balls, with the inner ring having two deep groove raceways and the outer ring a single continuous spherical raceway. This permits the inner and outer ring to be misaligned relative to each other through a comparatively large angle without imposing moment loads upon the balls. This bearing is frequently used when the inner ring is to be mounted upon an adapter sleeve or when conditions in the machine make it difficult to assure accurate alignment of the inner and outer rings.

Due to the small contact angle, the thrust capacity of these bearings is limited.



Cylindrical Bore

Tapered Bore

Angular Misalignment

The following is an approximate guide to the misalignment that can be accommodated in a double row self aligning ball bearing: 0.04 radians between 2.5 and 3 degrees depending on which series is used.

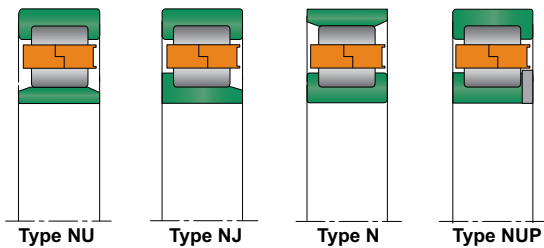
Bearing series	Permissible Angular Misalignment Degrees
1200 – 1222	2.5
1302 – 1318	3
2200 – 2222	2.5
2300 – 2318	3

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

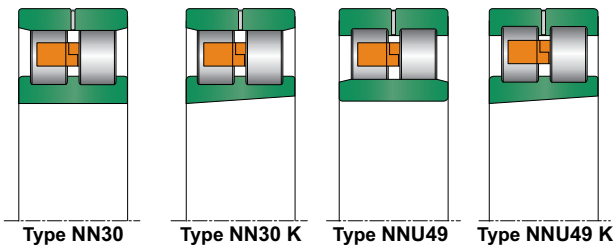
The rollers of these bearings are essentially cylindrical in shape, providing modified line contact with the cylindrical inner and outer ring raceways. The rollers are accurately guided by ground ribs on either the inner ring or the outer ring, thus making these bearings suitable for heavy radial loads and high speed operation. For best results, these bearings should be accurately aligned. The cylindrical shape of the rollers allows the inner ring to have considerable axial movement relative to the outer ring. This feature is valuable in accommodating thermal expansion in applications where both the inner ring and outer ring must be press-fitted. Also, since the inner and outer rings are separable from each other, the assembly of equipment is frequently facilitated.



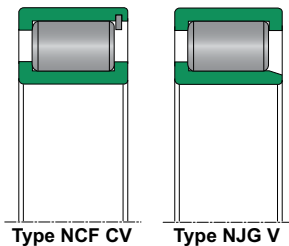
Single Row Cylindrical Roller Bearing



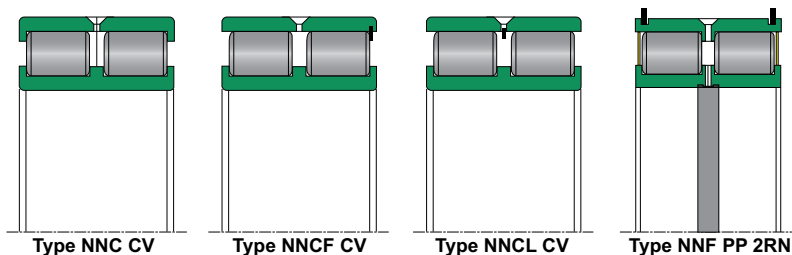
Double Row Cylindrical Roller Bearing



Single Row Full Cylindrical Roller Bearing



Double Row Full Cylindrical Roller Bearing



Angular Misalignment

the following is an approximate guide to the misalignment that can be accommodated in a cylindrical roller bearing:

0.0004 radians

Greater misalignment under heavy radial load can be critical.

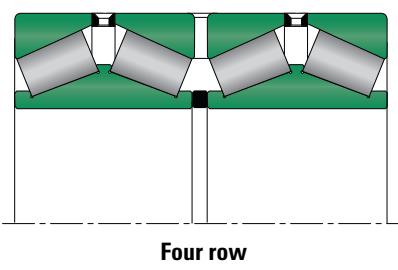
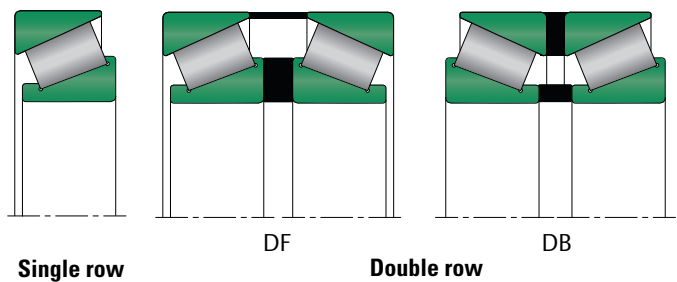
Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

This design utilizes conical rollers and raceways arranged so that all elements of the roller and raceway cones meet at a common apex on the axis of rotation. The rollers are guided by contact between the large end of the roller and a rib on the high capacity for radial loads and single direction thrust loads.

The bearings are usually mounted in pairs with axial adjustment to provide proper running clearance within the bearings. Being separable, inner and outer rings may be mounted individually. For heavy thrust loads, the type 30300 with large contact angle is desirable. Tapered roller bearings with two and four rows of rollers are used for special applications.



Matched



Angular Alignment

The following is an approximate guide to the misalignment that can be prevalent when fitting tapered roller bearings: 2 mins of arc. This is under normal loading conditions.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90010f

www.RollwaySmartGuide.com

Bearing characteristics - types and application

Spherical Roller Bearing

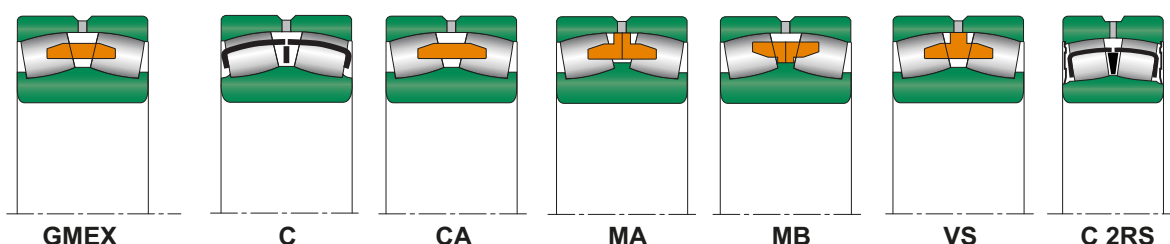
In this design, two rows of rollers operate in separate raceways ground into the inner ring with guide rib to guide the rollers. The outer ring has a single spherical raceway, thus allowing the inner ring and rollers to freely compensate for angular errors due to inaccurate machine components or due to elastic deflection of the shaft or housing under load.

As a result of the line contact, a large number of rollers, and the substantial contact angle, these bearings have large radial and thrust load capacity. They are suitable for heavy shock and impact loads and thus are extensively used in steel mills, rock crushers, and heavy industrial equipment.



GMEX is the Excellence line for Rollway®'s Spherical Roller Bearings. Benefits are excellent load ratings, long service life, smooth running, low noise and vibrations and low maintenance cost. GMEX bearings are produced with a higher grade steel, enhanced heat treatment process, higher machining accuracy and better surface roughness.

C 2RS type is a sealed spherical roller bearing with a steel cage C and 2 NBR seals. High temperature seals 2VS are available as well. Sealed bearings are filled with lithium based grease. Due to the seal, misalignment is reduced. As well for some types the bearing with differs from the standard width.



- GMEX** : 1 piece brass cage, roller guided between 2 inner ring flanges. Cage is guided on the rollers. Assymetrical roller position.
- C** : 2 pressed sheet steel cages, roller guided on a floating rings.
- CA** : 1 piece brass cage, roller guided between 2 inner ring flanges. Cage is guided on the rollers. Assymetrical roller position.
- MB** : 2 piece brass cage, roller guided between 2 inner ring flanges and one central rib. Cage is guided on the inner ring.
- VS C4 F80** : 1 piece brass cage, roller guided bür ring flanges. Cage is guided on the outer ring.
- MA C4 F80** : 2 piece brass cage, roller guided between 2 inner ring flanges and one central rib. Cage is guided on the outer ring.
- C 2RS** : Steel cage with 2 NBR seals

Angular Misalignment

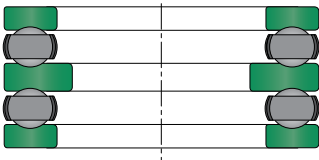
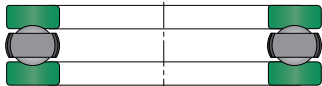
The following is an approximate guide to the misalignment that can be accommodated in a spherical roller bearing-between 1 and 2,5 degrees depending on which series is being used:

Bearing series	Permissible angular Misalignment degrees
213	1
222	1.5
223	2
230	1.5
231	1.5
232	2.5
240	2
241	2.5

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Thrust ball bearings are separable bearings. The single-acting thrust ball bearing consists of shaft washer, housing washer and ball set with cage, the double-acting type of a shaft washer (centre washer), two housing washer and two ball sets with cages.

Thrust ball bearings can be applied for high axial loads and low to medium speeds, they cannot, however, take radial loads. They are sensitive to angular deflection and characterized by extremely rigid guidance in axial direction. Depending on speed a minimum load is necessary to avoid sliding movements of the ball set, which are caused by centrifugal forces. To compensate for misalignments of the shaft, bearings with spherical housing washers and support washers should be used.



Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

The following procedure gives the steps to be followed when bearings are selected from the information contained in this catalog. It will be found satisfactory for most applications.

1. Determine the speed of the bearing.
Calculate the loads on the bearings.
2. Establish if accurate alignment can be obtained between the bearing seatings. If it cannot, then bearings that accommodate misalignment should be selected.
If the bearings rotate under load decide the life required, calculate the required dynamic load rating 'C' values, and then select suitable bearings that have comparable 'C' values.
3. If the bearings do not rotate under load select them by using the static load rating 'C₀'.
4. Check if the bearings are suitable for the speed and decide of grease or oil is to be the lubricant.
5. Select a suitable bearing arrangement of this is not already known; make sure that the seating fits required can be used with this arrangement.
6. Decide if bearings to 'Standard' or 'Extra Precision' limits of accuracy are required.
Select the most suitable range of radial clearance.
Choose the abutment diameters.
Choose suitable closures.
Issue mounting and handling instructions for the bearings if necessary.

Selecting Of Bearing Type

Each type of bearing has different properties, making it suitable for certain applications. The factors to be considered when choosing a bearing are numerous, so guidance is given to the main points when selecting a bearing. It must also be remembered that special consideration must be given to aspects relating to the running and operating, and to aspects relating to cases where at least one of the principal dimensions of the bearing has been determined by the machine design or shaft size.

Load And Direction Of Load

The magnitude and direction of the external loads, along with built in factors of safety, are two of the main points which determine the bearing size - and in some instances - the bearing type to be used. The important factors are the speed of rotation, temperature, the amount of precision required, mounting conditions, and running noise.

The following illustrations indicate the magnitude and direction of the external loads which the bearings will provide for.

Radial Loads

For light and medium radial loads, ball bearings are generally used; whereas for heavy loads and large shaft diameters, roller bearings are often the only choice.

Cylindrical roller bearings are available in several types. Types NU (with outer ring ribs), and N (with inner ring ribs) are only suitable for radial loads, whereas the NUP, NJ, and NJ with angle ring HJ can be used to a certain extent to take combined loads.

Thrust Loads

Thrust ball bearings are only suitable for light or medium purely axial loads. Double-acting thrust ball bearings can carry thrust loads in either direction. Spherical roller thrust bearings are used where heavy thrust loads are to be absorbed, and in addition can carry a certain amount of radial load acting simultaneously.

Combined Loads

If a radial and thrust load act on a bearing simultaneously, this is termed as a 'Combined Load'. The most important feature affecting the ability of carry axial loads is the angle of contact in relation to the shaft axis. The greater the angle, the more suitable the bearing is to accommodate axial loading. Combined loads are carried by deep groove ball bearings, self aligning ball bearings, four point bearings, single and double row angular contact bearings, spherical roller bearings, cylindrical roller bearing of the locating types and taper roller bearings.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Limiting Speed

The speeds at which bearings can rotate are limited by the bearing type, the operating load and the permissible operating temperature of the lubricant.

Bearings with low frictional resistance, and correspondingly low internal heat generation, are most suitable for high speeds with proper attention being given to the correct bearing clearance after mounting.

For radial loads the bearings most suitable are deep groove ball bearings or cylindrical roller bearings. For combined loads angular contact bearings should be selected.

Misalignment

Self aligning ball bearings, spherical roller bearings and spherical roller thrust bearings allow, at assembly, for the correction of misalignment where the shaft can be misaligned relative to the housing. Values for permissible angular misalignment are listed in the tables which precede the bearing sizes of those particular types.

Low Noise Level

Even though the running noise of rolling bearings is so low that it is lost in the background noise of other moving parts. It is sometimes of prime importance to reduce this to a minimum level for electric motors used, for example, in lifts for hospitals and hotels, and other domestic appliances. Such applications usually demand the fitting of a deep-groove ball bearing selected for low noise level.

Rigidity

This is sometimes a very important requirement, especially on machine tool spindles, where rigidity controls the bearing selection. In applications of this nature, single or double row cylindrical roller bearings or taper roller bearings are best suited, compared with the point contact of ball bearings. The stiffness can be further enhanced by pre-loading.

Axial Movement

In a normal bearing arrangement supporting a shaft, it is usual to locate one bearing (fixed) and allow the non locating bearing (free) to float in the housing, thus preventing axial pre-load as a result of thermal expansion of the shaft. Axial movement produced by thermal expansion can be accommodated by the use of a cylindrical roller bearing of the N or NU pattern. This allows axial movement to occur by displacement of the rollers over the track.

Tapered Bore And Sleeve Mounting

Tapered bore bearings are used for easier mounting and adjustments of the radial clearance. It is usual to fit sleeve bearings on a bright drawn steel bar, thus cutting machining costs and simplifying assembly. Withdrawal sleeves are used to ease the removal of the bearing. The residual clearance should be checked with the tables relating to the axial drive-up for spherical roller bearings and the bearing size.

Precision

Rolling bearings with a higher degree of precision than normal are required for shafts where running accuracy is of prime importance - for example, machine tools spindles and shafts rotating at very high speeds (see section relating to bearing tolerances).

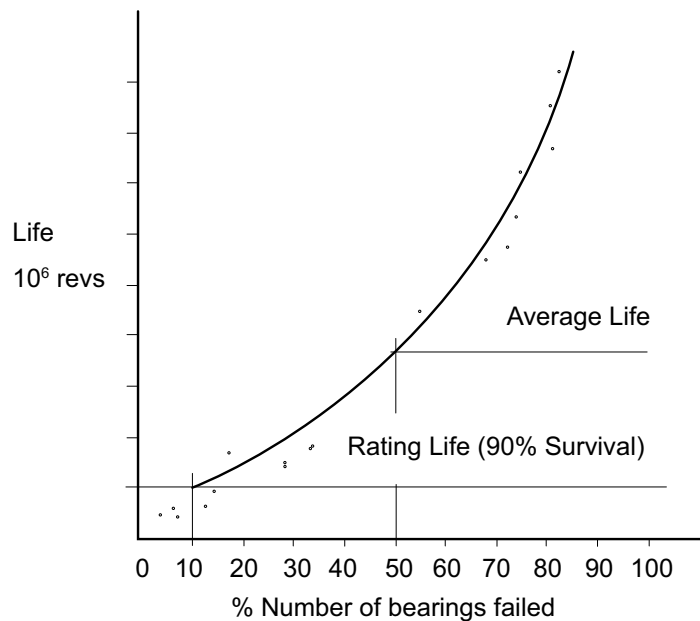
Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Determination Of Rolling Bearing Size

To determine the size of the bearing, static and dynamic load conditions and design life requirements must be considered. The load ratings for the size and type are given in the bearing tables on the appropriate pages.

Dynamic Loading

When a batch of apparently identical bearings is tested under identical load, speed, and operating conditions, a wide difference is obtained in the lives of the bearings. Typical results are plotted below - this graph shows the 'rating life' (sometimes called the 90% survival life). This is the calculated life obtained by following the procedure set out in this catalogue. Also shown is the average life, which is appreciably greater than the 'rating life'.



The required basic static load rating C_0 of a bearing can be determined using the equation:

$$C_0 = S_0 P_0$$

where:

C_0 = basic load rating [kN]

P_0 = equivalent static load [kN]

S_0 = static safety factor

For bearings operating in elevated temperatures, the hardness of the bearing material will be reduced.

The reason for this difference is that even with the best steel, minute imperfections exist in the material. As the area of contact between the rolling elements and rings under load is very small, these imperfections upset the distribution and intensity of stress in the material variations in contact area, resulting from the manufacturing tolerances on the rings and rolling elements, also contribute towards this difference.

In addition to the load conditions on a bearing, failure can also result from other factors - notably, lack of attention to lubrication, protection, or accuracy of mounting. These cannot be included in the basic load/life formulae.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Safety factor So

Values of So for a few typical non-rotating bearing applications are shown below and may be used as a guide.

Application	So Factor
Variable pitch propeller	0.5
Dams on aircraft	1.0
Swing bridges	1.5
Crane hooks for large cranes without additional dynamic forces	1.5
Small cranes for bulk goods with large additional dynamic forces	1.6

On rotating bearings where the load fluctuates dramatically, or where heavy shock loads occur during a fraction of a revolution, it is necessary to check that the basic static load rating is adequate. Heavy shock loads could cause permanent deformation, in the form of indentation being unevenly distributed over the raceway. Shock loads are also generally such that they cannot be calculated exactly. In some cases, they may also cause deformation of the housing, producing unfavorable load distribution. Depending on the operating conditions, the maximum load should not exceed a value determined by the static safety factor So.

Operating Conditions	So Factor (min)
Operation is smooth and vibration free	0.5
Operation is normal and vibration conditions normal	1.0
Pronounced shock loads	1.5 – 2
Demand on smooth running is of prime importance	2.0
For spherical roller thrust bearing	≥ 4

Basic Dynamic Load Rating Cr

Basic dynamic load rating (Cr) is defined as that constant radial load which a group of apparently identical radial ball bearings, angular contact ball bearings, and radial roller bearings can endure for a rating life of one million revolutions.

For thrust ball bearings the basic dynamic load rating is that constant, central, axial load which a group of apparently identical thrust bearings can endure for a rating life of one million revolutions.

Static Load Rating Co

The static load Co is defined as a load acting on a non-rotating bearing. Permanent deformations appear in rolling elements and raceways under static load of moderate magnitude and increase gradually with increasing load. The permissible static load is, therefore, dependent upon the permissible magnitude of permanent deformation.

Experience shows that a total permanent deformation of 0.0001 of the rolling element diameter, occurring at the most heavily loaded rolling element and raceway contact, can be tolerated in most bearing applications without impairment of bearing operation.

Rating Life

Rating life (L) is defined as the number of revolutions (or hours at some constant speed) that 90% of a group of apparently identical bearings will exceed before the first evidence of fatigue develops. This may be referred to as B10 life.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

The expression $L_u = (C/P)^p [10^6 \text{ revs}]$ is used to establish a mathematical relationship for the rating life as a function of the load where:

L_u = rating life in millions of revolutions of the inner ring with constant direction of loading

C = basic dynamic load rating in [kN]

P = equivalent dynamic load rating in [kN]

p = exponent for life equation, where as:

$p = 3$ for ball bearings

$p = 10/3$ for roller bearings

In most cases it is common practice to employ the rating life L_h (hours).

The relationship between L_u and L_h with constant rotational speed n (rpm) is

$$L_u = \frac{L_h \cdot n \cdot 60}{10^6} [10^6 \text{ revs}]$$

If the rating life of 1×10^6 revs, to which the basic load rating C refers, is resolved into a reference life $L_h = 500$ hours, and a reference rotation speed of $n = 33.1/3$ rpm it follows that:

For ball bearings: $\left(\frac{C}{P}\right)^3$

$$L_u = \frac{L_h \cdot n \cdot 60}{500 \cdot 33.1/3 \cdot 60} = \left(\frac{C}{P}\right)^3 [10^6 \text{ revs}]$$

or:

$$\sqrt[3]{\frac{L_h}{500}} = \sqrt[3]{\frac{33.1/3}{n} \cdot \frac{C}{P}}$$

letting: $\sqrt[3]{\frac{33.1/3}{n}}$ = speed factor f_n (equation 1)

and: $\sqrt[3]{\frac{L_h}{500}}$ = life factor f_L (equation 2)

The rating life equation may be obtained in the form life factor: $f_L = \frac{C}{P} \frac{f_n}{P}$

Basic load rating required: $C = \frac{P}{f_n} \frac{f_L}{P} [KG]$

The relationship of equation 1 and 2 are graphically represented the nomograms shown on page 90030K. Also on page 90030h are charts showing the L_{10} life in relation to C/P for ball and roller bearings.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90030h

www.RollwaySmartGuide.com

Bearing life calculation

Life table (millions of revolutions)

◀ back continue ▶

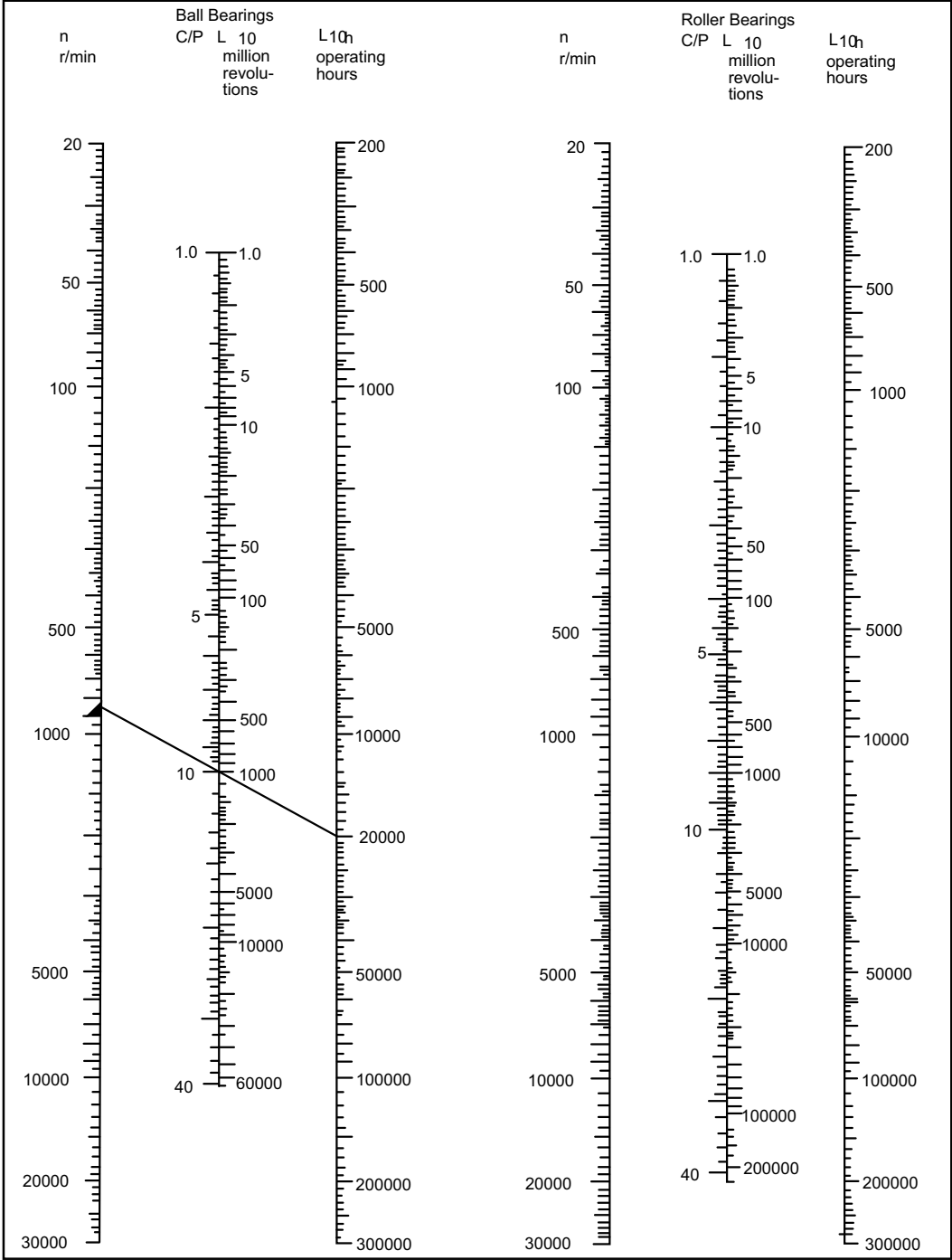
L ₁₀	C / P	
	Ball bearings	Roller bearings
0.5 0.75 1	0.793 0.909 1.00	0.812 0.917 1.00
1.5 2 3	1.14 1.26 1.44	1.13 1.24 1.39
4 5 6	1.59 1.71 1.82	1.52 1.62 1.71
8 10 12	2.00 2.15 2.29	1.87 2.00 2.11
14 16 18	2.41 2.52 2.62	2.21 2.30 2.38
20 25 30	2.71 2.92 3.11	2.46 2.63 2.77
35 40 45	3.27 3.42 3.56	2.91 3.02 3.13
50 60 70	3.68 3.91 4.12	3.23 3.42 3.58
80 90 100	4.31 4.48 4.61	3.72 3.86 3.98
120 140 160	4.93 5.19 5.43	4.20 4.40 4.58
180 200 220	5.65 5.85 6.04	4.75 4.90 5.04

L ₁₀	C / P	
	Ball bearings	Roller bearings
240 260 280	6.21 6.38 6.54	5.18 5.30 5.42
300 320 340	6.69 6.84 6.98	5.54 5.61 5.75
360 380 400	7.11 7.24 7.37	5.85 5.94 6.03
420 440 460	7.49 7.61 7.72	6.12 6.21 6.29
480 500 550	7.83 7.94 8.19	6.37 6.45 6.64
60 650 700	8.43 8.66 8.88	6.81 6.98 7.14
750 800 850	9.09 9.28 9.47	7.29 7.43 7.56
900 950 1 000	9.65 9.83 10.0	7.70 7.82 7.94
1 100 1 200 1 300	10.3 10.6 10.9	8.17 8.39 8.59
1 400 1 500 1 60	11.2 11.4 11.7	8.79 8.97 9.15
1 700 1 800 1 900	11.9 12.2 12.4	9.31 9.48 9.63

L ₁₀	C / P	
	Ball bearings	Roller bearings
2 000 2 200 2 400	12.6 13.0 13.4	9.78 10.1 10.3
2 600 2 800 3 000	13.8 14.1 14.4	10.6 10.8 11.0
3 200 3 400 3 600	14.7 15.0 15.3	11.3 11.5 11.7
3 800 4 000 4 500	15.6 15.9 16.5	11.9 12.0 12.5
5 000 5 500 6 000	17.1 17.7 18.2	12.9 13.2 13.6
6 500 7 000 7 500	18.7 19.1 19.6	13.9 14.2 14.5
8 000 8 500 9 000	20.0 20.4 20.8	14.8 15.1 15.4
9 500 10 000 12 000	21.2 21.5 22.9	15.6 15.8 16.7
14 000 16 000 18 000	24.1 25.2 26.2	17.5 18.2 18.9
20 000 25 000 30 000	27.1 29.2 31.1	19.5 20.9 22.0
- - -	- - -	- - -

◀ back continue ▶

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information



Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

To determine the size of a rolling bearing for a particular field of operation, it is necessary to establish the nominal life corresponding to the field of application.

Example

A deep groove ball bearing is required to run at speed $n=850$ RPM under constant radial load of $F_r = 5$ kN and is to achieve a basic rating life L_{10h} of 20.000 hours.

From the nomogram (page 90030k) using the right hand column (L_{10}), a line drawn from 20.000 to the left hand column (n RPM) passes through the centre column (C/P L_{10} 10.6) at 10:1000. Therefore, a bearing is required with a basic load rating C of at least $C = 10 \times 5$ kN. Reading from the tables relating to deep groove ball bearings, it can be seen that a bearing ref 6309 has a C value of 52.7 kN. Of course, the choice of bearing is also governed by the shaft and housing parameters.

For motor vehicles and rolling stock, the service life is expressed as a function of the wheel diameter and kilometers traveled as per formulae below:

$$L_{10} = \frac{1000}{\pi D} \cdot L_{10s}$$

or

$$L_{10s} = \frac{\pi D}{1000} L_{10}$$

where:

L_{10} = nominal life in 10^6 RPM

L_{10s} = life in 10^6 kilometers traveled

D = diameter of wheel in meters. Values for selecting service life in kilometers covered are in table below.

Vehicle type	$L_{10s}/10^6$ km
Wheel bearings for motor vehicles:	
cars	0.2
trucks, buses	0.4
Axle boxes for rolling stock – freight cars	0.8
Suburban traffic	1.5
Long distance coaches	3
Rail cars	3 - 1
Diesel and electric locomotives	3 - 4

Depending on the working temperature of the bearings, their service life is reduced at elevated temperatures.

This is to be taken into consideration when the service life is established by the application of temperature factor f_t specified in the table below:

Working temperature °C	150	200	250	300
Working temperature °F	302	392	482	572
Symbol	S0	S1	S2	S3
f_t	1	0.73	0.42	0.22

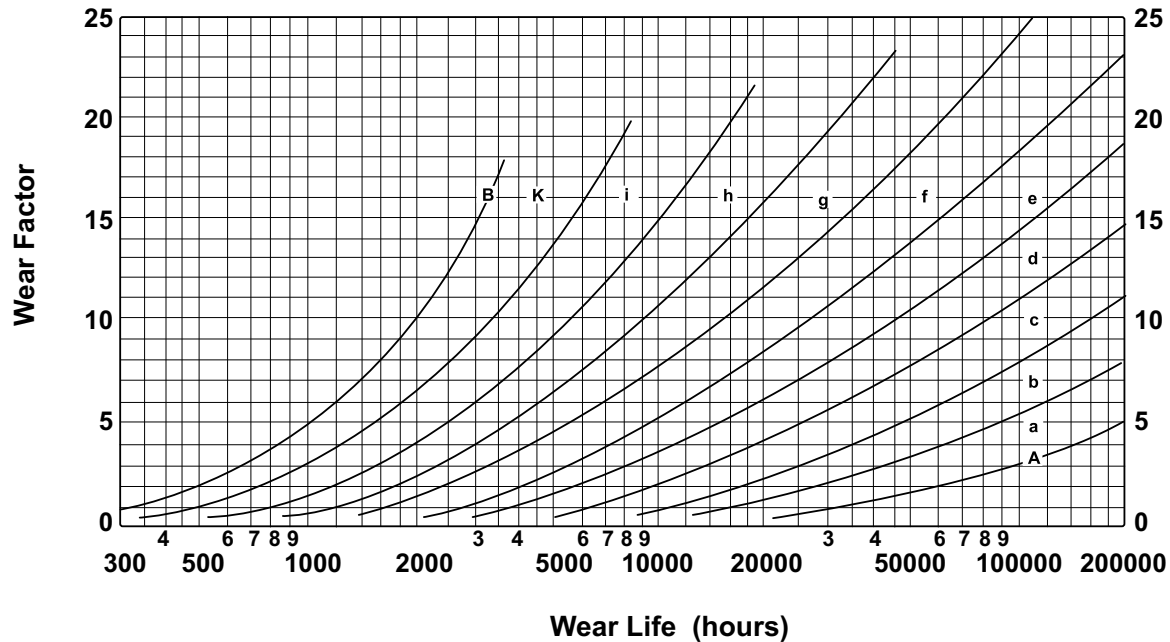
Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

In the following table are some recommendations for factor f_v along with typical applications and life factor f_L

Application	Fields of operating conditions	Factor f_v	Factor f_L
Motor vehicles - gear boxes - axle drives - water pumps - wheel bearings	g – k h – k k h – l	3 – 8 3 – 6 5 – 7 4 – 6	1.7 – 2.2 2 – 3 1.5 – 2 1.6 – 2.5
Railbound vehicles - haulage trolleys - trams - passenger coaches and freight cars - motor coaches and locomotives - gears	f – h e – f c – d d – e c – d	12 – 15 8 – 12 8 – 12 6 – 10 3 – 6	2.5 – 3 3.5 – 4 3 – 3.5 3.5 – 4 3 – 4.5
Motors - electric motors for household appliances - traction motors and standard motors - large motors	i – k c – d b – d	3 – 5 3 – 5 3 – 5	1.5 – 2 3.5 – 4.5 4 – 4.5
Machine-tools - lathe spindles and milling spindles - boring and grinding machine spindles - machine tool gears - electric and pneumatic tools	a – b c – d c – d g – h	0.5 – 1.5 0.5 – 1 3 – 8 3 – 6	3 – 4.5 2.5 – 3.5 3 – 4 1.8 – 2.7
Woodworking machines - milling cutter and cutter shaft - main bearing - rod bearing	e – f e – g c – d	0.5 – 3 3 – 4 2 – 3	3 – 4 3 – 4 2 – 3
Gears general engineering - universal gears - large-sized gears, stationary	d – c c – d	3 – 1 2 – 3	2 – 3 2 – 3
Materials handling - belt drives opencast mining - medium-sized and large fans - centrifugal pumps and compressors	c – d c – l d – f	5 – 12 3 – 5 3 – 5	4 – 6 3 – 4.5 3 – 4.5
Crushers, mills, screens etc. - jaw crushers, roll crushers	f – g	8 – 12	3 – 3.5
Hammer mills - hammer mills and impact mills - tube mills - vibrating mills - vibrating screens	d – c f – g f – g e – f	5 – 8 12 – 18 3 – 5 4 – 6	3.5 – 4.5 3 – 5 2 – 3 2.5 – 3

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

The wear life diagram indicates the operating conditions, with the least wear factor at curve A and the heaviest wear occurring at curve B. The area between A and B is subdivided into individual fields from a to k. It can be seen that the operating conditions deteriorate progressively.



Adjusted rating life
Adjustments to life equations

$$L_{10} = \left(\frac{C}{P} \right)^p$$

The above formula is adequate for conventional applications, but in exceptional cases other factors must be considered which influence the life of the bearing. To accommodate these factors, the ISO life equation is:

$$L_{na} = a_1 \cdot a_2 \cdot a_3 \cdot \left(\frac{C}{P} \right)^p$$

or

$$L_{na} = a_1 \cdot a_2 \cdot a_3 \cdot L_{10}$$

where:

L_{na} = adjusted rating life in 10^6 revolutions the index being the difference between the specified probability life and 100%

a_1 = life adjustment factor for reliability

a_2 = life adjustment for material

a_3 = life adjustment for operating conditions

Calculations for the adjusted rating life are based on the pre-conditions mentioned in the above formulae; for example, that bearing loads can be calculated with accuracy considering all aspects of the loads involved along with shaft deflection etc.

Also, that reliability of the bearing materials are in accordance with the corresponding C values and that normal operating conditions $a_1=a_2=a_3=1$ and that two life equations become identical.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Life Adjustment Factor a_1 For Reliability

The a_1 factor is used to determine lives which are obtained or exceeded with a greater probability than 90% (L10). The table below lists the factors for failure probability values between 10% and 1% L10 being the normal rating life.

Probability %	Failure probability %	Life before fatigue appears	Factor a_1
90	10	L10	1
95	5	L5	0.62
95	4	L4	0.53
97	3	L3	0.44
98	2	L2	0.33
99	1	L1	0.21

Life Adjustment Factor a_2 For Material

The factor a_2 accounts for the properties of the material and its heat treatment. $a_2=1$ is applicable to the high quality steels used in the production of normal bearing series.

Life Adjustment Factor a_3 For Operating Conditions

The operating condition factor a_3 is primarily determined by bearing lubrication, providing bearing temperatures are not excessive. For elevated temperatures, see reduction in dynamic load rating in table below.

Working temperature °C	150	200	250	300
Working temperature °F	302	392	482	572
Symbol	S0	S1	S2	S3
ft	1	0.73	0.42	0.22

The efficiency of lubrication is determined primarily by the degree of separation between the rolling elements and raceways. The highest life values are reached when there is a hydrodynamic state of lubrication (where metal to metal contact does not exist between rolling elements and raceway), and under the cleanliness conditions which would normally prevail in an adequately sealed bearing arrangement. The a_3 factor is based on the viscosity ratio K – this is defined as the ratio of the actual lubricant viscosity V for the viscosity v_1 required for adequate lubrication. With thinner lubricating films, there is an increase in metal to metal contact and life expectancy decreases.

Life Adjustment Factor a_{23}

Since a_2 and a_3 factors are interdependent, the factor combination a_{23} is used.

$$a_{23} = a_2 \cdot a_3$$

and

$$Lna = a_1 \cdot a_{23} \cdot L [10^6 \text{ revs}]$$

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Since the fatigue life modified by the adjustment factors a_1 , a_2 , and a_3 only considers material fatigue as the cause of failure, the calculated life corresponds to the service life only if the following points are met:

- (a) Lubrication conditions are constant throughout.
- (b) Loads and speeds used for analysis are a true reflection of the actual operating conditions.
- (c) Operating viscosity is based on actual operating temperature.
- (d) Lubricant contamination is limited during the whole running time.
- (e) The service life limited by wear and break down of lubrication is not shorter than the fatigue life.

Wear of the acting surfaces is primarily caused by contamination which, over a period of time, may penetrate the bearing. The situation is made worse by inadequate lubrication and corrosion due to condensation. The amount of wear experienced in a bearing is dependant on the operating conditions, lubrication, and effective sealing arrangement.

Wear Factor

$$fv = \frac{v}{e_o}$$

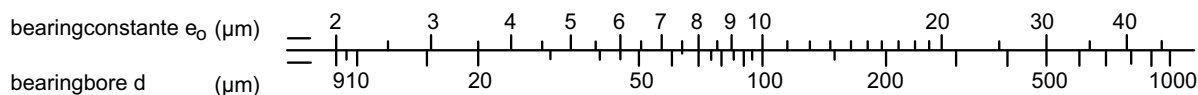
The permissible amount of wear is expressed by the wear factor fv .

where:

v = permissible increase in radial clearance (mm)

e_o = bearing constant depending on the bore diameter – see below for

e_o values in relationship with bore diameter mm.



Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Equivalent Dynamic Load

$$P = XFr + YFa \quad [\text{kN}]$$

The factors X and Y depend upon the ratio Fa/Co . (The relationship of the axial load to the basic static load) the values shown in the table are applicable to bearings mounted with normal fits – shafts machined to j5 or k5 and housings to J6.



Equivalent Static Load

$$Po = Fr \quad \text{when} \quad Fa / Fr \leq 0.8 \quad [\text{kN}]$$

$$Po = 0.6Fr + 0.5Fa \quad \text{when} \quad Fa / Fr > 0.8 \quad \text{kN}$$

Calculation factors X and Y for deep groove ball bearings:

Fa/Co	Normal radial clearance					Radial clearance C3					Radial clearance C				
	Fa / Fr ≤ e			Fa / Fr > e		Fa / Fr ≤ e			Fa / Fr > e		Fa / Fr ≤ e			Fa / Fr > e	
	e	X	Y	X	Y	e	X	Y	X	Y	e	X	Y	X	Y
0.025	0.22	1	0	0.56	1.2	0.31	1	0	0.46	1.75	0.4	1	0	0.44	1.12
0.04	0.24	1	0	0.56	1.8	0.33	1	0	0.46	1.62	0.42	1	0	0.44	1.36
0.07	0.27	1	0	0.56	1.6	0.36	1	0	0.46	1.46	0.44	1	0	0.44	1.27
0.13	0.31	1	0	0.56	1.4	0.41	1	0	0.46	1.3	0.48	1	0	0.44	1.16
0.25	0.37	1	0	0.56	1.2	0.46	1	0	0.46	1.14	0.53	1	0	0.44	1.05
0.5	0.44	1	0	0.56	1	0.54	1	0	0.46	1	0.56	1	0	0.44	1

Other dynamic & static load
calculation
Go to:



Self Aligning
Ball Bearings



Angular Contact
Ball Bearings



Cylindrical
Roller Bearings



Tapered
Roller Bearings



Spherical
Ball Bearings



Thrust
Ball Bearings



Thrust Spherical
Roller Bearings

Axial Loading Capacity

If deep groove ball bearings are axially loaded this should generally not exceed 0.5 Co.
For small bearings and light series the axial load should not exceed 0.25 Co.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Equivalent Dynamic Load

$$P = Fr + Y_1 Fa \quad \text{when} \quad Fa/Fr \leq e$$

$$P = 0.65 Fr + Y_2 Fa \quad \text{when} \quad Fa/Fr > e$$

The values for Y_1 , Y_2 and e are given in the bearing tables.

Equivalent Static Load

$$Po = Fr + Y_0 Fa$$

The Y_0 values are given in the bearing tables.

Axial Load Capacity When Mounted On Adapter Sleeves

When double row self aligning ball bearings are mounted on adapter sleeves fitted on smooth shafts, the axial load the bearing will carry depends on the friction between the sleeve bore and the shaft. The allowable axial load can be calculated by the formula

$$F_{az} = 3 \cdot B d$$

where:

F_{az} = maximum allowable axial load (N)

B = bearing width (mm)

d = bore diameter (mm)



Other dynamic & static load
calculation
Go to:



Deep Groove
Ball Bearings



Angular Contact
Ball Bearings



Cylindrical
Roller Bearings



Tapered
Roller Bearings



Spherical
Ball Bearings



Thrust
Ball Bearings



Thrust Spherical
Roller Bearings

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

For single row angular contact ball bearings (series 72B and 73B) with contact angle of 40°, the following relations apply:

Single and tandem mounted bearings:

$$P = F \quad \text{when: } Fa/Fr \leq 1.14$$

$$P = 0.35 Fr + 0.57 Fa \quad \text{when: } Fa/Fr > 1.14$$

Bearing pairs arranged back to back or face to face:

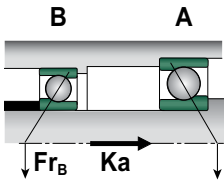
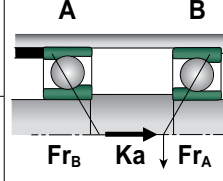
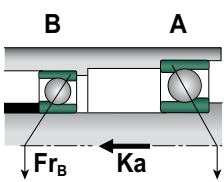
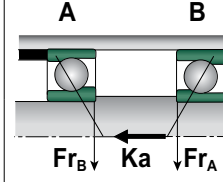
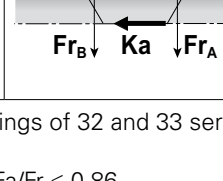
$$P = Fr + 0.55 Fa \quad \text{when: } Fa/Fr \leq 1.14$$

$$P = 0.57 Fr + 0.93 Fa \quad \text{when: } Fa/Fr > 1.14$$

Paired bearings, Fr and Fa are the loads acting on the pair.

Since the loads are transmitted from one raceway to the other in an inclined position, radial loads induce axial reaction forces which must be considered when calculating the equivalent dynamic load. For calculation purposes, the equations show where bearing A and bearing B are subjected to a radial load Fr_A and Fr_B , respectively, and are always considered positive even when they act in the opposite direction to that shown in the figures. The radial loads act at what is termed the "pressure center" of the bearings, which is given in the bearing tables as dimension "a". There is an external force $K_a = 0$; the equations are valid only if the bearings have been adjusted against each other to practically zero clearance and no preload.

Bearing arrangement and load equation

Face to Face	Back to Back
 1a) $F_{rA} \geq F_{rB}$ $K_a \geq 0$ $F_{aA} = 1.14 F_{rA}$ $F_{aB} = F_{aA} + K_a$	 1b) $F_{rA} < F_{rB}$ $K_a \geq 1.14 (F_{rB} - F_{rA})$ $F_{aA} = 1.14 F_{rA}$ $F_{aB} = F_{aA} + K_a$
 2a) $F_{rA} \leq F_{rB}$ $K_a \geq 0$ $F_{aA} = F_{aB} + K_a$ $F_{aB} = 1.14 F_{rB}$	 2b) $F_{rA} > F_{rB}$ $K_a \geq 1.14 (F_{rA} - F_{rB})$ $F_{aA} = F_{aB} + K_a$ $F_{aB} = 1.14 F_{rB}$
	 2c) $F_{rA} > F_{rB}$ $K_a < 1.14 (F_{rA} - F_{rB})$ $F_{aA} = 1.14 F_{rA}$ $F_{aB} = F_{aA} - K_a$

Note: for double row angular contact ball bearings of 32 and 33 series with one piece inner ring:

$$P = Fr + 0.73 Fa \quad \text{when } Fa/Fr \leq 0.86$$

$$P = 0.62 Fr + 1.17 Fa \quad \text{when } Fa/Fr > 0.86$$

Equivalent Static Load

For single row angular contact ball bearings of the 72 B and 73 B series, for bearings mounted singly or paired in tandem:

$$P_o = 0.5 Fr + 0.26 Fa \quad \text{when } P_o < Fr \text{ } P_o = Fr \text{ should be used}$$

For bearing pairs arranged back to back or face to face:

$$P_o = Fr + 0.52 Fa \quad \text{when } Fr \text{ and } Fa \text{ are the loads acting on the pair of bearings}$$

Note: for double row angular contact bearings of 32 and 33 series with one piece inner ring:

$$P_o = Fr + 0.63 Fa$$



Other dynamic & static load calculation
Go to:



Deep Groove Ball Bearings



Self Aligning Ball Bearings



Cylindrical Roller Bearings



Tapered Roller Bearings



Spherical Ball Bearings



Thrust Ball Bearings



Thrust Spherical Roller Bearings

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Equivalent Load Calculation Dynamic

Equivalent Dynamic Load $P = X Fr + Y Fa$			
Series	Contact angle	Single mounting / Tandem	Back to Back /Face to Face arrangement
7200/7300 (Single row)	40° Suffix B	$P = Fr$ when $Fa/Fr \leq 1,14$	$P = Fr + 0,55 Fa$ when $Fa/Fr \leq 1,14$
		$P = 0,35 Fr + 0,57 Fa$ when $Fa/Fr > 1,14$	$P = 0,57 Fr + 0,93 Fa$ when $Fa/Fr > 1,14$
	25° Suffix A	$P = Fr$ when $Fa/Fr \leq 0,68$	$P = Fr + 0,92 Fa$ when $Fa/Fr \leq 0,68$
		$P = 0,41 Fr + 0,87 Fa$ when $Fa/Fr > 0,68$	$P = 0,67 Fr + 0,41 Fa$ when $Fa/Fr > 0,68$
	15° Suffix C	$P = Fr$ when $Fa/Fr \leq e$	$P = Fr$ when $Fa/Fr \leq e$
		$P = 0,44 Fr + Y (1) Fa$ when $Fa/Fr > e$	$P = 0,72 Fr + Y (2) Fa$ when $Fa/Fr > e$
3200/3300 (Double row)	30°	$P = Fr + 0,73 Fa$ when $Fa/Fr \leq 0,86$	-
		$P = 0,62 Fr + 1,17 Fa$ when $Fa/Fr > 0,86$	



Other dynamic & static load calculation
Go to:



Deep Groove Ball Bearings



Self Aligning Ball Bearings



Cylindrical Roller Bearings



Tapered Roller Bearings



Spherical Ball Bearings



Thrust Ball Bearings



Thrust Spherical Roller Bearings

Equivalent Load Calculation Static

Equivalent Static Load $P_0 = X Fr + Y Fa$			
Series	Contact angle	Single mounting / Tandem	Back to Back /Face to Face arrangement
7200/7300 (Single row)	40° Suffix B	$P = Fr$ when $P_0 \leq Fr$	$P = Fr + 0,52 Fa$
		$P = 0,5 Fr + 0,26 Fa$ when $P_0 > Fr$	
	25° Suffix A	$P = Fr$ when $Fa/Fr \leq 1,3$	$P = Fr + 0,76 Fa$
		$P = 0,5 Fr + 0,38 Fa$ when $Fa/Fr > 1,3$	
	15° Suffix C	$P = Fr$ when $Fa/Fr \leq 1,09$	$P = Fr + 0,92 Fa$
		$P = 0,5 Fr + 0,46 Fa$ when $Fa/Fr > 1,09$	
3200/3300 (Double row)	30°	$P = Fr + 0,63 Fa$	-

Thrust factors Y and e are dependant on given in tables below:

Single bearings and tandem mounted bearings:	For Back to Back & Face to Face arrangements																																																	
The thrust factor Y and values of e are dependant on $\frac{Fa}{iCo}$ given in tables below. where: Co = static load rating [kN] i = number of bearings <table><tr><th>$\frac{Fa}{i.Co}$</th><th>e</th><th>Y</th></tr><tr><td>0.025</td><td>0.4</td><td>1.42</td></tr><tr><td>0.04</td><td>0.42</td><td>1.36</td></tr><tr><td>0.07</td><td>0.44</td><td>1.27</td></tr><tr><td>0.13</td><td>0.48</td><td>1.16</td></tr><tr><td>0.25</td><td>0.53</td><td>1.05</td></tr><tr><td>0.50</td><td>0.56</td><td>1</td></tr></table>	$\frac{Fa}{i.Co}$	e	Y	0.025	0.4	1.42	0.04	0.42	1.36	0.07	0.44	1.27	0.13	0.48	1.16	0.25	0.53	1.05	0.50	0.56	1	The thrust factor Y and values of e are dependant on $\frac{Fa}{iCo}$ given in table below. where: Co = static load rating of the single bearing kN. <table><tr><th>$\frac{Fa}{i.Co}$</th><th>e</th><th>$Fa/Fr \leq e$ Y</th><th>$Fa/Fr > e$ Y</th></tr><tr><td>0.025</td><td>0.4</td><td>1.6</td><td>2.3</td></tr><tr><td>0.04</td><td>0.42</td><td>1.5</td><td>2.2</td></tr><tr><td>0.07</td><td>0.44</td><td>1.4</td><td>2.1</td></tr><tr><td>0.13</td><td>0.48</td><td>1.3</td><td>1.9</td></tr><tr><td>0.25</td><td>0.53</td><td>1.2</td><td>1.7</td></tr><tr><td>0.50</td><td>0.56</td><td>1.1</td><td>1.6</td></tr></table>	$\frac{Fa}{i.Co}$	e	$Fa/Fr \leq e$ Y	$Fa/Fr > e$ Y	0.025	0.4	1.6	2.3	0.04	0.42	1.5	2.2	0.07	0.44	1.4	2.1	0.13	0.48	1.3	1.9	0.25	0.53	1.2	1.7	0.50	0.56	1.1	1.6
$\frac{Fa}{i.Co}$	e	Y																																																
0.025	0.4	1.42																																																
0.04	0.42	1.36																																																
0.07	0.44	1.27																																																
0.13	0.48	1.16																																																
0.25	0.53	1.05																																																
0.50	0.56	1																																																
$\frac{Fa}{i.Co}$	e	$Fa/Fr \leq e$ Y	$Fa/Fr > e$ Y																																															
0.025	0.4	1.6	2.3																																															
0.04	0.42	1.5	2.2																																															
0.07	0.44	1.4	2.1																																															
0.13	0.48	1.3	1.9																																															
0.25	0.53	1.2	1.7																																															
0.50	0.56	1.1	1.6																																															

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

The equivalent dynamic radial load of a cylindrical roller bearing subjected to a pure radial load is:

$$P = F_r \text{ [kN]}$$

The equivalent static load of a cylindrical roller bearing subjected to a pure radial load is:

$$P_o = F_r \text{ [kN]}$$

The axial dynamic capacity of a roller bearing having ribs on the outer or inner races (types NJ, NUP and HJ) is:

$$F_{az} = \frac{K_1 C \text{ or } 10^4}{n (d+D)} - K_2 F_r$$

where:

F_{az} = maximum allowable axial load [N]

C = static radial load [N]

F_r = radial component of loading [N]

n = speed [RPM]

d = inner diameter [mm]

D = outer diameter [mm]

K_1 = auxiliary factor, see table

K_2 = auxiliary factor, see table

Factor K_1 and K_2



Other dynamic & static load calculation
Go to:



Deep Groove
Ball Bearings



Self Aligning
Ball Bearings



Angular Contact
Ball Bearings



Tapered
Roller Bearings



Spherical
Ball Bearings



Thrust
Ball Bearings



Thrust Spherical
Roller Bearings

Lubrication		
Factor	grease	oil
K_1	10.	6
K_2	0.005	0.003

The permissible axial load depends on the ability of the roller ends to slide on the surface of the ribs (not fatigue values). It is therefore very important that adequate lubrication is present to assist this and dissipate heat generated by this action. The formula mentioned above is used as a guidance to calculate a suitable axial load along with the "k" factor mentioned in table 2. The formula is based on ideal conditions with (a) maximum temperature differential of up to 60°C (140°F) between ambient and bearing temperature (b) a specific heat elimination of 0.5 mW/mm² C (c) viscosity ratio k 1.5. "k" indicates an effective viscosity ratio v at working temperatures, against v1 viscosity required for a satisfactory lubrication of the bearing.

In case of grease lubrication for v ratio, the basic oil viscosity will be used. If viscosity ratio "K" is smaller than 1.5, friction and wear is generated. These can be reduced at lower speeds by use of oils with EP additives.

The thrust loads F_{az} obtained by the formulae are valid for constant axial loadings. For short duration the values can be doubled and may be trebled for shock loads.

For cylindrical roller bearings to function satisfactorily under thrust loads, there must also be radial loads present. The ratio of F_a/F_r should not exceed 0.4.

The axial loading of bearings has, of course, a certain influence upon their service life. This influence can be practically ignored if the F_a/F_r ratio is ≤ 0.2 in case of bearings in series 10, 2, 3, and 4, and $F_a/F_r \leq 0.4$ for bearings in series 22 and 23.

In any case of thrust loads which act upon bearings, factor F_a (N) should not exceed the numerical value of $1.5 D^2$ (D = outer diameter of the bearing in mm).

In case of certain high thrust loads ($F_a \geq D^2$), it is recommended to have the ribs of inner and outer rings completely supported by the integral parts of the shaft & housing.

NUP, NJ and HJ type bearings, which take thrust loads from both directions, should always be so arranged that – if the construction of the bearing permits it – main thrust loads are taken by the ribs.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

$$P = Fr \quad \text{wher} \quad Fa/Fr \leq e$$

$$P = 0.4 Fr + YFa \quad \text{wher} \quad Fa/Fr > e$$

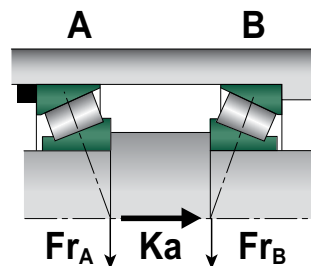
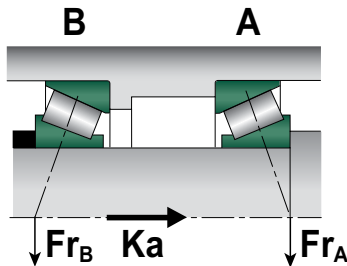
For paired single row tapered roller bearings:

$$P = Fr + Y_1 Fa \quad \text{wher} \quad Fa/Fr \leq e$$

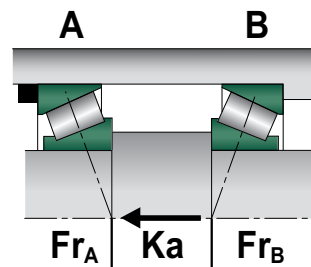
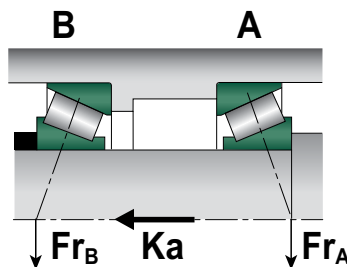
$$P = 0.67 Fr + Y_2 Fa \quad \text{wher} \quad Fa/Fr > e$$

For paired bearings Fr and Fa are the loads acting on the pair.

Since the loads are transmitted from one raceway to the other in an inclined position, radial loads induce axial reaction forces which must be considered when calculating the equivalent dynamic load. For calculation purposes, the equations show where bearing A and bearing B are subjected to a radial load Fr_A and Fr_B , respectively, and are always considered positive even when they act in the opposite direction to that shown in the figures. The radial loads act at what is termed the "pressure center" of the bearings, which is given in the bearing tables as dimension "a". There is an external force $Ka = 0$; the equations are valid only if the bearings have been adjusted against each other to practically zero clearance and no preload.



Condition 1	Condition 1	Fa in A	Fa in B
$\frac{F_{rA}}{Y_A} \geq \frac{F_{rB}}{Y_B}$	$K_a \geq 0$	$F_{aA} = \frac{0.5F_{rA}}{Y_A}$	$F_{aB} = F_{aA} + K_a$
$\frac{F_{rA}}{Y_A} < \frac{F_{rB}}{Y_B}$	$K_a \geq 0.5 \left(\frac{F_{rB}}{Y_B} - \frac{F_{rA}}{Y_A} \right)$	$F_{aA} = \frac{0.5F_{rA}}{Y_A}$	$F_{aB} = F_{aA} + K_a$
$\frac{F_{rA}}{Y_A} < \frac{F_{rB}}{Y_B}$	$K_a < 0.5 \left(\frac{F_{rB}}{Y_B} - \frac{F_{rA}}{Y_A} \right)$	$F_{aA} = F_{aB} - K_a$	$F_{aB} = \frac{0.5F_{rB}}{Y_B}$



Condition 1	Condition 1	Fa in A	Fa in B
$\frac{F_{rA}}{Y_A} \leq \frac{F_{rB}}{Y_B}$	$K_a \geq 0$	$F_{aA} = F_{aB} + K_a$	$F_{aB} = \frac{0.5F_{rB}}{Y_B}$
$\frac{F_{rA}}{Y_A} > \frac{F_{rB}}{Y_B}$	$K_a \geq 0.5 \left(\frac{F_{rA}}{Y_A} - \frac{F_{rB}}{Y_B} \right)$	$F_{aA} = F_{aB} + K_a$	$F_{aB} = \frac{0.5F_{rB}}{Y_B}$
$\frac{F_{rA}}{Y_A} > \frac{F_{rB}}{Y_B}$	$K_a < 0.5 \left(\frac{F_{rA}}{Y_A} - \frac{F_{rB}}{Y_B} \right)$	$F_{aA} = \frac{0.5F_{rA}}{Y_A}$	$F_{aB} = F_{aA} - K_a$



Other dynamic & static load calculation
Go to:



Deep Groove
Ball Bearings



Self Aligning
Ball Bearings



Angular Contact
Ball Bearings



Cylindrical
Roller Bearings



Spherical
Ball Bearings



Thrust
Ball Bearings



Thrust Spherical
Roller Bearings

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Equivalent Dynamic Load

$$P = Fr + Y1 Fa \quad \text{when } Fa/Fr \leq e$$

$$P = 0.67 \cdot Fr + Y2 \cdot Fa \quad \text{when } Fa/Fr > e$$

Values for Y1, Y2 and e are given in the bearing tables.

Equivalent Static Load

$$Po = Fr + Yo Fa$$

Values for Yo are given in the bearing tables.

Axial Load Capacity When Mounted On Adapter Sleeves

When spherical roller bearings are mounted on adapter sleeves fitted on smooth shafts, the axial load it will carry depends on the friction between the sleeve bore and the shaft.

The allowable axial load can be calculated by the formula

$$Faz = 3 Bd$$

Faz = maximum permissible axial load [N]

B = bearing width mm

d = bearing bore diameter mm



Other dynamic & static load
calculation
Go to:



Deep Groove
Ball Bearings



Self Aligning
Ball Bearings



Angular Contact
Ball Bearings



Cylindrical
Roller Bearings



Tapered
Roller Bearings



Thrust
Ball Bearings



Thrust Spherical
Roller Bearings

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Equivalent Dynamic Load

$$P = Fa$$

Where Fa is the axial load (ball thrust bearings can accommodate thrust loads only).

Equivalent Static

$$Po = Fa$$

Minimum Axial Load

Ball thrust bearings must have a minimum thrust load to function correctly.

This ensures that sliding does not occur due to centrifugal forces acting on the ball and cage assembly.

This can be calculated from:

$$F_{am} = M \left(\frac{n \text{ Max}}{1000} \right)^2 [N]$$

where:

F_{am} = minimum thrust load [N]

M = factor for minimum load (see tables)



Other dynamic & static load
calculation
Go to:



Deep Groove
Ball Bearings



Self Aligning
Ball Bearings



Angular Contact
Ball Bearings



Cylindrical
Roller Bearings



Tapered
Roller Bearings



Spherical
Ball Bearings



Thrust Spherical
Roller Bearings

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Equivalent Dynamic Load

$$P = Fa + 1.2 Fr \quad \text{Providing } Fr \leq 0.55 Fa$$

Equivalent Static Load

$$Po = Fa + 2.7 Fr \quad \text{Providing } Fr \leq 0.55 Fa$$

Minimum Axial Load

This can be calculated from:

$$Fam = \frac{1.25 Co}{1000} \text{ [kN]}$$

where:

Fam = minimum axial load [kN]

Fr = radial component of load for bearings subjected to combined load [kN]

Co = basic static load [kN]

In many cases, the axial load acting on the bearing produced by the weight of the supporting component parts and external forces is greater than the required minimum load. If this is not the case, then bearings must be preloaded (for example, using springs).



Other dynamic & static load
calculation
Go to:



Deep Groove
Ball Bearings



Self Aligning
Ball Bearings



Angular Contact
Ball Bearings



Cylindrical
Roller Bearings



Tapered
Roller Bearings



Spherical
Ball Bearings

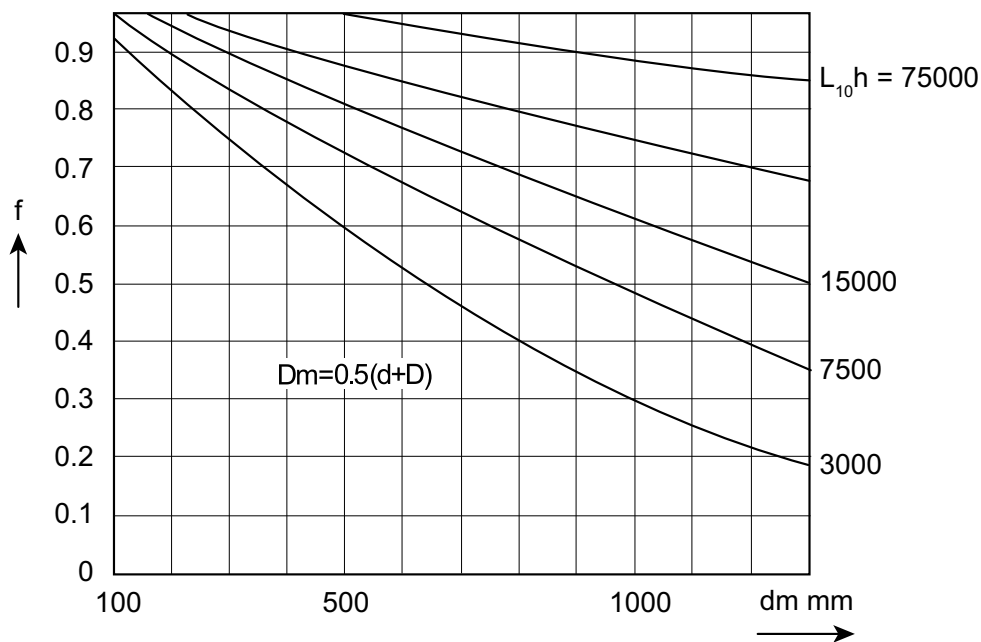


Thrust
Ball Bearings

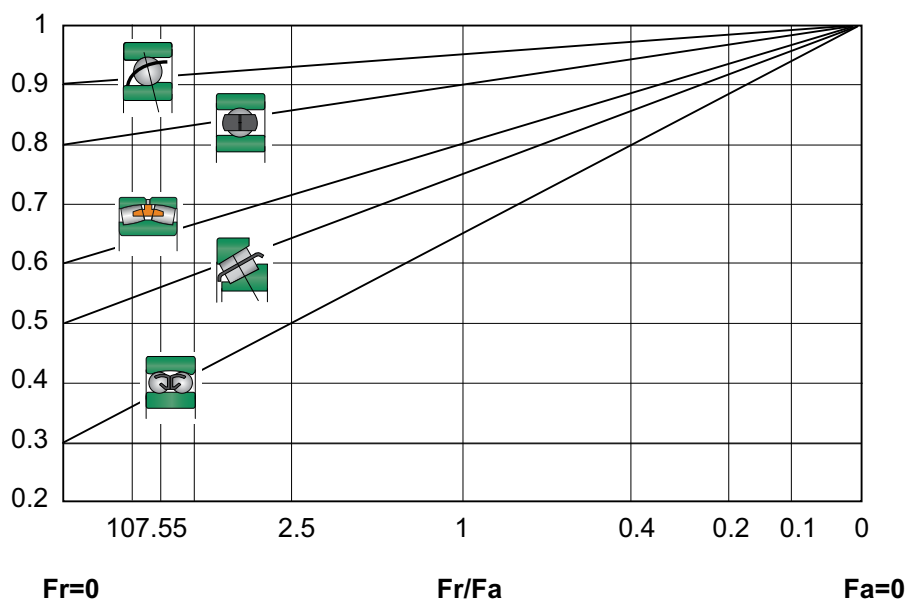
Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

The maximum rotational speed of ball and roller bearings depends upon various factors: the size and design of the bearing, type of lubrication (whether grease or oil), and type of cage fitted, along with the internal clearance of the bearing when mounted. If the radial run-out (which produces out of balance forces) is reduced, then higher speeds can be obtained. Reduction of cage weight will also reduce out of balance forces, such as when made from light alloy or plastic. Cages that are centered on the inner or outer races rather than the rolling elements are used for high speed applications. With the surface of the riding lips having been specially ground, lubrication between the sliding surfaces must be maintained. Heavier loads influence the speed and also affect the basic rating life of $L_{10h} \leq 75000$ hours.

In such cases, the speeds listed in the tables should be multiplied by a factor f which you can obtain from the diagram below.



For combined loads, the speeds indicated in the bearing tables are to be multiplied by the reduction factor f_1 given in diagram below.



For ball thrust bearings, there must be a minimum load applied to counteract the centrifugal forces of the balls on rotation. Factor M is indicated in the bearing tables against the appropriate bearing size.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Bearing rings and rolling elements are subjected to high stresses on a very small contact area, and must have a high resistance to wear as well as high elastic and fatigue limits. Primarily these are manufactured from high-carbon chromium bearing steel with a chemical composition as indicated in table below, and are in accordance with SAE 52100 - 100Cr6.

High carbon chromium bearing steel

Steel Grade		Chemical Composition %					
		C	Mn	Si	Cr	S	P
ROL1	100 Cr6	0.90..1.05	0.25..0.40	0.15..0.35	1.40..1.65	<0.025	<0.025
	100 CrMnSi6-4	0.90..1.05	1.00..1.20	0.50..0.70	1.40..1.60	0.020	<0.025
ROL2 (GMEX)		0.94~1.04	0.25~0.45	0.15~0.35	1.40~1.60	≤0.012	≤0.020

For large bearings that are subjected to high shock loads, carburized low carbon alloy steels are used. Such steels, when carburized to the correct depth, have the added advantage of having a hard surface - and because the core is softer, it is more energy absorbing.

CAGE MATERIALS

Types of cages for bearings vary in accordance with the operating conditions. The most common are those made from pressed steel. Machined cages are made from high strength copper alloys or carbon steel, and for high speeds manufactured from plastic or phenolic resins.

HEAT TREATMENT

Bearings are generally used up to a temperature of maximum + 150°C (+302°F). In case of higher temperatures, bearings with special heat treatments should be used. Sealed bearings, 2RS type, should be used at operating temperatures up to +80°C (+176°F). If this temperature is exceeded, the efficacy of lubricants is considerably reduced.

In order to use bearings at a higher operating temperature, the bearings have to be subjected to a special heat treatment. This will ensure the dimensional stability, but will reduce the lifetime by a factor (ft) as per the table below.

Operating temp °C	150	200	250	300
Working temperature °F	302	392	482	572
Symbol	S0	S1	S2	S3
ft	1	0.73	0.42	0.22

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Prefixes

- S - Stainless steel components
- K - Cylindrical roller and cage thrust assembly
- L - Removable inner or outer ring
- R - Removable bearing with no inner ring
- F - Shaft washer of thrust ball bearing
- W - Housing washer of thrust ball bearing
- WS - Shaft washer of thrust roller bearing
- GS - Housing washer of thrust roller bearing

Suffixes

Modifications to internal design of bearings.

Deep Groove Ball Bearings

- EMQ - Electric motor quality

Single Row Angular Contact Ball Bearings

- A - Contact angle of 25°
- B - Contact angle of 40°
- C - Contact angle of 15°

Tapered Roller Bearings

- A - Increased load capacity

Cylindrical Roller Bearings

- E - Increased load capacity
- NA - Non-interchangeable components
- M - Brass cage guided on the rollers
- EM - Increased load capacity and brass cage guided on the rollers
- EMA - Increased load capacity and brass cage guided on the outer ring

Spherical Roller Thrust Bearing

- EM - Increased load capacity and new brass cage

Spherical Roller Bearings

- C - Pressed steel cage and loose guide ring
- CA - one piece brass cage, guided on the rollers. Assymetrical roller position
- GMEX - Improved precision, roundness and surface finish, rings and rollers are manufactured in high grade ROL2 steel, one piece robust brass cage, guided on the rollers.
- MB - 2 piece brass cage , guided on the inner ring
- VS C4 F80 - Special bearing for vibration screen application, d<320
- MA C4 F80 - Special bearing for vibration screen application, d>320

Modifications to external design of bearings

- X - Boundary dimensions altered according to ISO
- K - Bearings with tapered bore 1:12
- K30 - Bearings with tapered bore 1:30
- R - Flange on outer ring of bearing
- N - Snap ring groove on outer ring of bearing
- NR - Snap ring groove with snap ring
- N2 - Diametrically opposed notches on outer ring corner
- RS - Seal on one side of bearing
- 2RS - Seals on both sides of bearing
- Z - Shield on one side of bearing
- ZZ - Shields on both sides of bearing
- TM - Polyamide cage

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Grease & Oil
lubrication

Systems oil
lubrication

General Guidelines

The main duties of introducing lubricants into ball and roller bearings, apart from protecting the finely finished surfaces when rotating at high speeds, is to reduce friction between the rolling elements, the separator or cage, and the races at any point where true rolling is absent. Lubrication also assists in dissipating heat, and sealing the bearing against the entry of contaminants such as dust and moisture.

Rolling bearings may be lubricated with oil or grease. The choice of lubricant is usually decided by temperature, speed, load, and operating conditions along with bearing design. We summarise as follows:

Size of bearing

The size of bearing governs the viscosity of the lubricant – the larger the bearing the higher should be the viscosity. Regarding size, rolling bearings can be divided into four sizes depending on the outside diameter:

Very small bearings	$D \leq 22 \text{ mm}$
Small bearings	$D \leq 62 \text{ mm}$
Medium bearings	$62 \leq D \leq 240 \text{ mm}$
Large bearings	$D \geq 240 \text{ mm}$

1. Speed

Speed has an influence upon the viscosity of the lubricant because the resisting force, opposed to the moving parts by the lubricant, depends on its viscosity. The higher the revolution speed, the lower the viscosity of the lubricant should be.

The revolution speed may be:

Normal $n \leq 75\%$ of the limit speed specified in the tables

High $75\% \leq 100\%$ of the limit speed specified in the tables

Very high $n \geq 100\%$ of the limit speed specified in the tables. For very high revolution speeds, oil lubrication is required to transfer frictional heat or other sources of heat away from the bearing.

2. Load

Equivalent loading capacity, $P = XFr + YFa$, conditions the viscosity grade of the lubricant, due to specific pressure which appears between the contact surfaces. The higher this is, the greater the resistance of the lubricant film should be, and the respective viscosity.

Loads may vary as follows:

normal loads where

$P/Cr \leq 0.1$ for bearings within diameter ranges 1, 2 and 3.

$P/Cr \leq 0.15$ for bearings within diameter range 4.

high loads where

$P/Cr \geq 0.1$ for bearings within diameter ranges 1, 2 and 3.

$P/Cr \geq 0.15$ for bearings within diameter range 4.

P = equivalent dynamic load [kN]

Cr = basic dynamic load [kN]

3. Temperature

The operating temperature affects selection of lubricants, as it is an influence upon viscosity. Therefore, each lubricant is used only within the limits of certain clearly defined temperature ranges.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

General
Guidelines

Systems oil
lubrication

Grease Lubrication

Although oil is the better lubricant, grease is often preferred because of the following natural advantages:

Grease helps to form an effective closure between the shaft and housing, thus preventing the ingress of dirt, moisture and other corrosive agents.

Grease protects the finely finished working surfaces of a bearing by clinging to them, particularly when the bearing is not in motion. Oil tends to drain away, leaving the surfaces open to attack.

Grease is easier to retain within the housing than oil. This is of great help in the food, printing, textile, chemical and other industries where contamination or staining can ruin the product.

Grease is convenient to handle, and re-lubrication of bearings is quick and clean. Planned lubrication cycles are often possible, resulting in smaller labour costs.

Whatever type of grease is used, it should have no tendency to separate under operating conditions. When separation occurs, the oil runs out of the bearing and leaves behind dry soap, which hardens and cakes. This interferes with the movement of the rolling element, which may result in overheating and mechanical failure. Excessive softening is also undesirable, because the grease might then leak out of the bearing and leave working surfaces unprotected.

The quantity of grease used for the lubrication of a rolling bearing should not be too great, as a tightly packed bearing is liable to overheat if operated at high speed. Relubrication intervals depend on the bearing type, inner diameter and revolution speed for filling with fresh grease. The quantity required is given in the following equation:

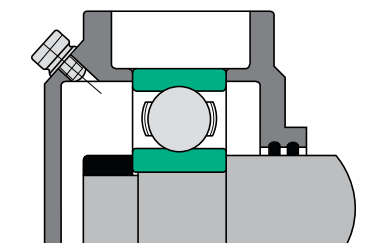
$$G = 0.005 \text{ DB grams}$$

where:

D = outer diameter (m/m)

B = width (m/m)

After a certain number of refills, it is necessary to remove old grease completely using a suitable solvent. Never mix two grades of grease.



Typical Grease Lubrication

Oil Lubrication

Oil is sometimes more convenient to use than grease, and there are circumstances when it is definitely preferred. These are as follows:

When frictional resistance in light machinery and instruments must be kept low.

Where either the speed or the temperature is too high for grease lubrication.

Where high temperature and heavy load occur together, with or without high speed.

Where the bearings are enclosed in a casing that contains other components lubricated by oil, e.g. a gearbox.

A good quality mineral oil should be used of a viscosity to suit the operating conditions involved. Vegetable or animal oils are not recommended as these can become rancid under certain conditions and cause corrosion problems. A small supply of oil is required to lubricate the bearings; a more copious supply should be used if the bearing must be kept cool, when it is often advantageous to use a synthetic oil to cope with the temperature conditions. Limiting temperature for mineral oil is about 150°C (302°F) and for synthetic oils about 220°C (428°F).

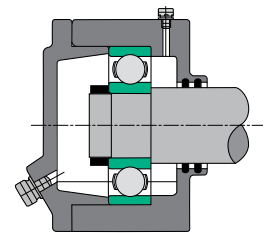
Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

General Guidelines

Grease & Oil lubrication

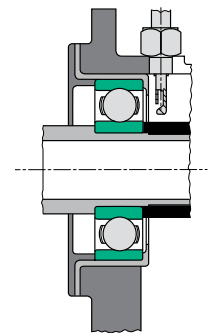
Oil Bath

This method is suitable for horizontal shaft applications. The oil should reach the center of the bottom ball or roller in the bearing; a greater depth than this could cause overheating due to churning of the oil. The surface area and volume of the oil in the bath should be sufficiently large to maintain an adequate depth of oil for the cage to dip into when running. Sight oil level indicators can be used. Alternatively, a tapped and plugged hole can be provided at the correct level; when replenishing the oil, the plug is removed and oil added until it starts to escape through the hole. The plug should, of course, be replaced before the machine is started!



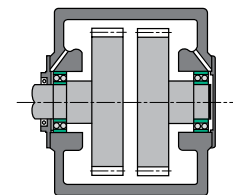
Pump-Feed Lubrication

This is especially suitable for heavily loaded, high-speed bearings, since such conditions can result in bearing temperatures well in excess of 100°C (212°F). Oil is pump-fed to each bearing, being directed by jets on to the outside diameter of the inner ring so that some of it gains access to the internal parts of the bearing. Each bearing may require from 45 to 140 litres of oil per hour, although most of this only flushes the face of the bearing to keep it cool. A reservoir is often provided to lubricate the bearing during starting: alternatively, the pump can be started before the machine is set in motion so that the bearing never runs unlubricated.



Splash Lubrication

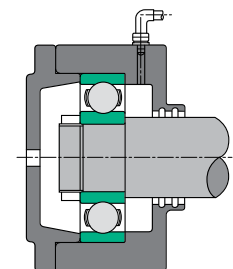
This is suitable when the bearings are enclosed in a casing, such as a gearbox, and the oil used to lubricate the gears is distributed sufficiently to lubricate the bearings. The oil is either splashed directly on to the bearings or collected in galleries and directed to the bearings. The drawing below illustrates how the oil is made to pass through the bearing before it returns to the gearbox casing.



Oil Mist System

One important advantage of this method of lubrication is that only a small quantity of oil is required, carried in a stream of compressed air. The oil mist equipment should be turned on before the machine is set in motion so as to ensure that the bearings are constantly covered by a thin film of oil when rotating.

Oil mist is advantageous for applications such as machine tools (where it can also be used to lubricate slideways, gears, chains and other components), since the air escaping from the bearing housing prevents the ingress of foreign matter. The flow of air also keeps the bearing cool. It is important that the compressed air used is absolutely clean and dry.



Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Storage

1. Store ball and roller bearings in a clean, dry place in their original wrappings. This will preserve them from deterioration.
2. Use older stock first.
3. Do not stack too many large bearings on top of each other. This can cause the protective oil to be squeezed out from between the bearing and its wrapping, thus leading to corrosion problems. Also, never store large bearings upright, but lay them flat.

Fitting

4. Absolute cleanliness is essential when handling bearings. They should not be removed from their wrappings until required for fitting. A smooth, metal-topped bench that can be wiped clean is a great advantage. All tools, shafts, housings and other components must be perfectly clean. If fitting operations are delayed or interrupted, the assembly should be wrapped with greaseproof paper to exclude dirt and dust.
5. Bearings are usually coated with a rust-preventative oil, unless pre-lubricated and/or packed to suit individual requirements. There is no need to remove this oil unless:
 - It is sufficient to cause serious dilution of the oil or grease used in the bearing. This normally applies to smaller bearings where the rust - preventative oil represents a large proportion of the required amount of lubricant.
 - Low torque is required.
 - A synthetic lubricant is used that may not be compatible with the protecting oil.

To remove the rust preventive oil, wash the bearing in a good quality cleaning fluid. Allow the bearings to drain thoroughly and dry them. The following are satisfactory methods for drying:

 - Place the bearing in an oven or on a hot plate with a temperature of 65-80°C (149-176°F).
 - Direct dry, clean, compressed air on to the bearings. The cage and rings of smaller bearings must be held firmly. A sudden blast of air can rapidly accelerate the free bearing parts, causing the balls to skid and damaging the highly finished internal surfaces of the bearing. The fitting of the rings on their seatings are very important. Therefore, ensure that the shaft and housing seatings are of correct size and of good shape.
6. All shoulders must be smooth and square with the axis of rotation.
7. Never drive one ring on to its seating by blows on the other. Such blows cause damage to the balls or rollers and raceways.
8. Apply pressure evenly around the rings. A press is better than a hammer.
9. Should a hammer be used, a mild steel or brass tube of suitable size should be interposed between it and the bearing. This will distribute the force of the taps, which should be given progressively around the ring.
10. When the inner ring, outer ring and rollers of a separable roller bearing are brought together, they must be properly in alignment with each other. When not aligned, the rollers are unable to slide freely, and force would need to be used to bring the parts together. Such force would result in the rollers and raceways becoming scored. This, in addition to causing noisy running, can cause early failure of the bearing.
11. Where the ring of a bearing is to be against an abutment, make sure it is properly seated.
12. For heavy interference fits, inner rings may be shrunk onto their seatings after heating in clean mineral oil at a temperature of approximately 100%. Confirm that the bearing is in contact with the abutment shoulder after it has cooled.
13. In the case of taper clamping sleeve and nut bearings, the clamping nut must not be over-tightened. This can expand the inner ring and eliminate all clearance within the bearing, or even fracture the inner ring.

It is recommended that when using pin spanners, they have a length of approximately five times the shaft diameter. After the nut has been tightened as much as possible by hand pressure, one or two light hammer blows should be given to the handle of the spanner; this should tighten the nut sufficiently. It is good practice, if possible, to check that the sleeve is still clamped firmly to the shaft after a few days running.

As an additional precaution it is recommended that, whenever possible, the bearings are fitted so that the rotation of the shaft tends to tighten the nut on the sleeve.

When using torque spanners, it is recommended that the following torques be applied to the clamping nut:

For LIGHT series bearings:

Shaft Diameter	Torque on Nut
1" and 25m/m	7.6 Kgm/M (55 lbs ft)
1 1/2" and 40 m/m	12.4 Kgm/M (90 lbs ft)
2" and 50 m/m	17.25 Kgm/M (125 lbs ft)
3" and 75 m/m	30.3 Kgm/m (220 lbs ft)

For MEDIUM series bearings, increase the above figures by approximately 50 percent.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

14. Unnecessary removal of a bearing should be avoided, particularly where interference fits have been used. Removal can damage a bearing and, in some instances, cause deterioration of the interference fit. Very often it is sufficient to clean and relubricate the bearing in its fitted position.

Only remove a bearing if you need to inspect it closely. Symptoms that may require close inspection are the condition of the lubricant, the bearing temperature and noise level.

15. Sometimes a ball locating bearing is installed with roller journal bearings. This may be only push fit on the shaft, and therefore easily dismantled.
16. In certain applications, some form of extractor may be necessary. This must act directly on the ring to be removed. Never try to remove the inner ring by applying force to the outer ring, or vice versa.
17. Thrust bearings are usually installed with push fits, and should offer no difficulty. Take care to keep the rings aligned, however, to prevent them from binding.
18. Carefully protect bearings from dirt and moisture while they are out of their housings. It is advisable to wash them thoroughly immediately after removal, using the following procedure:
 - Immerse in a washing fluid, such as clean white spirit or good-quality paraffin. The washing fluid must not attack the bearing components. After soaking, move each separate bearing around in the fluid, using a basket or other container if convenient. Occasional slow oscillations of the bearing rings will help to dislodge dried out grease and other matter.
 - When clean, thoroughly drain and dry.
 - Lubricate the bearing immediately and re-fit. Alternatively, completely coat all parts with a rust preventative oil, working it well into the internal parts of the bearing. Then wrap the bearing in greaseproof paper and box until required for re-fitting, when the bearing will require re-lubricating.
19. Worn shafts, housings and abutments must have attention if creep has occurred. Do not resort to knurling, scoring, or distortion of the seating on which creep has occurred in order to simulate an interference fit. Such deceptive practices are ineffective, and creep will quickly return. In addition, even if the ring is prevented from creeping it will usually be distorted by the seating, resulting in bearing failure due to local overloading of the raceways and of the balls or rollers.
20. Worn shafts, housings and abutments must have attention if creep has occurred. Do not resort to knurling, scoring, or distortion of the seating on which creep has occurred in order to simulate an interference fit. Such deceptive practices are ineffective, and creep will quickly return. In addition, even if the ring is prevented from creeping it will usually be distorted by the seating, resulting in bearing failure due to local overloading of the raceways and of the balls or rollers.

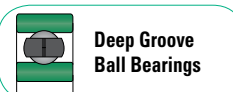
Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Radial clearance

Radial clearance is the total internal clearance between the balls or rollers in a bearing and their raceways, measured normal to the axis of the bearing. This clearance compensates for: expansion of the inner ring and/or contraction of the outer ring when interference fits are used for differential expansion of the two rings when the inner ring of a bearing operates at a higher temperature than the outer ring affects the end play of ball bearings and also affects their capacity for carrying axial loads – the greater the radial clearance, the greater the capacity for supporting axial load. When bearings with small radial clearances are used, special attention must be given to the selection of seating dimensions. Once ball and roller bearings are mounted and running, a small amount of radial or running clearance is normally desirable. In the case of bearings under radial load, quieter running is generally obtained when this clearance is at minimum. Radial clearance figures for ball and roller bearings mentioned in our tables are in accordance with I.S.O. recommendations. For normal applications, the general guide given in Table 1 below may be used. Excessive radial tightness in the bearing should be avoided under all conditions.

Table 1 – Summarizing The Correct Radial Clearance

Radial clearance of bearing	Fit of races on seating	Possibility of temperature changes reducing radial clearance
C2	No appreciable interference either race	absent
CN	One race only interference fit	absent
C3	One race only interference fit	present
C3	Both races interference fit	absent
C4	Both races interference fit	present



Deep Groove Ball Bearings



Angular Contact Ball Bearings



Self Aligning Ball Bearings



Cylindrical Roller Bearings



Spherical Roller Bearings



Tapered Roller Bearings

- C2 fit** These bearings have the smallest amounts of radial clearance. They should only be used where freedom from all play is required in the assembled bearing, and there is no possibility of the initial radial clearances being eliminated by external causes. Therefore, special attention must be given to the seating dimensions, as the expansion of the inner ring or contraction of the outer ring may cause tight bearings.
- CN fit** This grade of radial clearance is intended for use where only one ring is made interference fit, and there is no appreciable loss of clearance due to temperature differences. Ball and roller bearings for general engineering applications are usually of this clearance.
- C3 fit** This grade of radial clearance should be used when both rings of a bearing are made an interference fit, or when only one ring is an interference fit but there is likely to be some loss of clearance due to temperature differences. It is the grade normally employed for roller journal bearings on general engineering applications, especially where there is a tendency for "creep" to take place due to out-of-balance loading. It is also the grade normally used for ball bearings that take axial loading, but for some purposes even "C4" fit bearings may be required.
- C4 fit** This is the grade of radial clearance to adopt when there will be some loss of clearance due to temperature differences and both races must be an interference fit. One example of its use is in bearings for traction motors.

Where seating limits give an interference fit tighter than the recommended figures, or where temperature differences could cause radial tightness, the correct clearance can be established by calculating the maximum loss of clearance at both extremes of the following basis. A suitable clearance grade from the tables can then be selected.

Total lost of clearance = RI + RO + RT + RM

- RI = Expansion of inner ring raceway due to shaft interference. (See table below).
- RO = Contraction of outer ring raceway due to housing interference. (See table below).
- RT = Loss of clearance due to the inner ring being at a higher temperature than the outer ring.
- RM = Loss of clearance due to increase in seating interference, resulting from nonferrous seating expanding or contracting at different rates from bearing steel.

Table 2 below gives approximate values for RO and RI assuming a solid shaft and substantial housing.

Bearing series	Inner ring raceway expansion RI	Outer ring raceway Contraction RO
Extra light	100% interference	80% interference
Light	80% interference	60% interference
Medium and heavy	70% interference	50% interference

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90090c

www.RollwaySmartGuide.com

Fits and internal clearances

Single Row & Double Row Deep Groove Ball Bearings

With Cylindrical Bore - Clearance to ISO 5753-2009

Radial clearance

Normal bore diameter d mm		Symbol of clearance group									
		C2		CN		C3		C4		C5	
		Radial clearance of bearing µm									
over	up to	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
2,5	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73
50	65	1	15	10	30	25	43	38	61	55	90
65	80	1	15	8	28	23	51	46	71	65	105
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140
120	140	2	23	18	48	41	81	71	114	105	160
140	160	2	23	18	53	46	91	81	130	120	180
160	180	2	25	20	61	53	102	91	147	135	200
180	200	2	30	25	71	63	117	107	163	150	230
200	225	2	35	25	85	75	140	125	195	175	265
225	250	2	40	30	95	85	160	145	225	205	300
250	280	2	45	35	105	90	170	155	245	225	340
280	315	2	55	40	115	100	190	175	270	245	370
315	355	3	60	45	125	110	210	195	300	275	410
355	400	3	70	55	145	130	240	225	340	315	460
400	450	3	80	60	170	150	270	250	380	350	510
450	500	3	90	70	190	170	300	280	420	390	570
500	560	10	100	80	210	190	333	310	470	440	630
560	630	10	110	90	230	210	360	340	520	490	690
630	710	20	130	110	260	240	400	380	570	540	780
710	800	20	140	120	290	270	450	430	630	600	840
800	900	20	160	140	320	300	500	480	700	670	940
900	1000	20	170	150	350	330	550	530	770	740	1040
1000	1120	20	180	160	380	360	600	580	850	820	1150
1120	1250	20	190	170	410	390	650	630	920	890	1260
1250	1400	30	220	200	450	430	710	680	1100	980	1380



Fits and internal clearances index

Other fits & internal clearances Go to:



Self Aligning Ball Bearings



Angular Contact Ball Bearings



Cylindrical Roller Bearings



Tapered Roller Bearings



Spherical Roller Bearings

With Tapered Bore - Clearance to ISO 5753-2009

Radial clearance

Normal bore diameter d		Symbol of clearance group							
		C2		CN		C3		C4	
mm	up to	Radial clearance of bearing μm							
over		min.	max.	min.	max.	min.	max.	min.	max.
2,5	10	2	13	8	23	14	29	20	37
10	18	3	18	11	25	18	33	25	45
18	24	5	20	13	28	20	36	28	48
24	30	5	20	13	28	23	41	30	53
30	40	6	20	15	33	28	46	40	64
40	50	6	23	18	36	30	51	45	73
50	65	8	28	23	43	38	61	55	90
65	80	10	30	25	51	46	71	65	105
80	100	12	36	30	58	53	84	75	120
100	120	15	41	36	66	61	97	90	140
120	140	18	48	41	81	71	114	105	160
140	160	18	53	46	91	81	130	120	180
160	180	20	61	53	102	91	147	135	200
180	200	25	71	63	117	107	163	150	230
200	225	25	85	75	140	125	195	175	265
225	250	30	95	85	160	145	225	205	300
250	280	35	105	90	170	155	245	225	340
280	315	40	115	100	190	175	270	245	370
315	355	45	125	110	210	195	300	275	410
355	400	55	145	130	240	225	340	315	460
400	450	60	170	150	270	250	380	350	510
450	500	70	190	170	300	280	420	390	570
500	560	80	210	190	333	310	470	440	630
560	630	90	230	210	360	340	520	490	690
630	710	110	260	240	400	380	570	540	780
710	800	120	290	270	450	430	630	600	840
800	900	140	320	300	500	480	700	670	940
900	1000	150	350	330	550	530	770	740	1040
1000	1120	160	380	360	600	580	850	820	1150
1120	1250	170	410	390	650	630	920	890	1260
1250	1400	200	450	430	710	680	1100	980	1380

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®

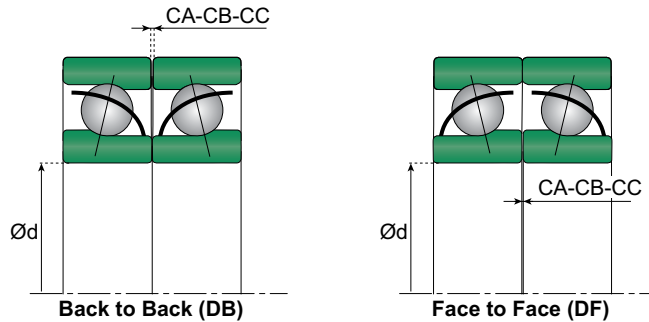


90090e

www.RollwaySmartGuide.com

Fits and internal clearances

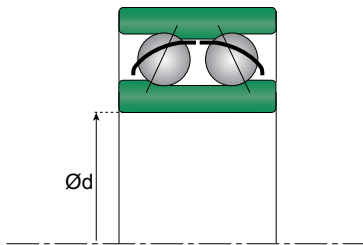
Single & Double Row Angular Contact Ball Bearings



Fits and internal clearances index

Axial clearance Single row angular contact ball bearings arranged in "DB" and "DF" pairs

Normal bore diameter d		Series 32 and 33					
		Class					
		CA		CB		CC	
mm		Axial clearance of bearing µm					
over	up to	min.	max.	min.	max.	min.	max.
-	18	5	13	15	23	24	32
18	30	7	15	18	26	32	40
30	50	9	17	22	30	40	48
50	80	11	23	26	38	48	60
80	120	14	26	32	44	55	67
120	180	17	29	35	47	62	74
180	250	21	37	45	61	74	90
250	315	26	42	52	68	90	106



Axial Clearance

Double Row Angular Contact Ball Bearings

Normal bore diameter d		Series 32 and 33						Series 33D normal	
		C2		CN		C3			
mm		Axial clearance of bearing µm							
over	up to	min.	max.	min.	max.	min.	max.	min.	max.
-	10	1	11	5	21	12	28	-	-
10	18	1	12	6	23	13	31	-	-
18	24	2	14	7	25	16	34	-	-
24	30	2	15	8	27	18	37	-	-
30	40	2	16	9	29	21	40	33	54
40	50	2	18	11	33	23	44	36	58
50	65	3	22	13	36	26	48	40	63
65	80	3	24	15	40	30	54	46	71
80	100	3	26	18	46	35	63	55	83
100	110	4	30	22	53	42	73	65	96
Radial clearance ≈ 0,6 axial clearance									

Radial clearance ≈ 0,6 axial clearance

Other fits & internal clearances Go to:



Deep Groove Ball Bearings



Self Aligning Ball Bearings



Cylindrical Roller Bearings



Tapered Roller Bearings



Spherical Roller Bearings

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90090h

www.RollwaySmartGuide.com

Fits and internal clearances

Double Row Self Aligning Ball Bearings

With cylindrical bore - Clearance to ISO 5753-2009

Radial Clearance

Normal bore diameter d		Symbol of clearance group							
		C2		CN		C3		C4	
mm		Radial clearance of bearing μm							
over	up to	min.	max.	min.	max.	min.	max.	min.	max.
2,5	6	1	8	5	15	10	20	15	25
6	10	2	9	6	17	12	25	19	33
10	14	2	10	6	19	13	26	21	35
14	18	3	12	8	21	15	28	23	37
18	24	4	14	10	23	17	30	25	39
24	30	5	16	11	24	19	35	29	46
30	40	6	18	13	29	23	40	34	53
40	50	6	19	14	31	25	44	37	57
50	65	7	21	16	36	30	50	45	69
65	80	8	24	18	40	35	60	54	83
80	100	9	27	22	48	42	70	64	96
100	120	10	31	25	56	50	83	75	114
120	140	10	38	30	68	60	100	90	135
140	160	15	44	35	80	70	120	110	161



Fits and internal clearances index

Other fits & internal clearances
Go to:



Deep Groove
Ball Bearings



Angular Contact
Ball Bearings



Cylindrical
Roller Bearings



Tapered
Roller Bearings



Spherical Roller
Bearings

With tapered bore - Clearance to ISO 5753-2009

Radial Clearance

Normal bore diameter d		Symbol of clearance group							
		C2		CN		C3		C4	
mm		Radial clearance of bearing μm							
over	up to	min.	max.	min.	max.	min.	max.	min.	max.
18	24	7	17	13	26	20	33	28	42
24	30	9	20	15	28	23	39	33	50
30	40	12	24	19	35	29	46	40	59
40	50	14	27	22	39	33	52	45	65
50	65	18	32	27	47	41	61	56	80
65	80	23	39	35	57	50	75	69	98
80	100	29	47	42	68	62	90	84	116
100	120	35	56	50	81	75	108	100	139
120	140	40	68	60	98	90	130	120	165
140	160	45	74	65	110	108	150	140	191

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90090m

www.RollwaySmartGuide.com

Fits and internal clearances

Single & Double Row Cylindrical Roller Bearings

With interchangeable component parts
Cylindrical Bore - Clearance to ISO 5753-2009
Radial Clearance

Bore diameter d mm		Clearance group symbol									
		C2		CN		C3		C4		C5	
		Radial clearance of bearing μm									
over	up to	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
2,5	6	-	-	-	-	-	-	-	-	-	-
6	10	-	-	-	-	-	-	-	-	-	-
10	14	-	-	-	-	-	-	-	-	-	-
14	24	0	25	20	45	35	60	50	75	65	90
24	20	0	25	20	45	35	60	50	75	70	95
30	40	5	30	25	50	45	70	60	85	80	105
40	50	5	35	30	60	50	80	70	100	95	125
50	65	10	40	40	70	60	90	80	110	110	140
65	80	10	45	40	75	65	100	90	125	130	165
80	100	15	50	50	85	75	110	105	140	155	190
100	120	15	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	100	145	145	190	200	245
140	160	20	70	70	120	115	165	165	215	225	275
160	180	25	75	75	125	120	170	170	220	250	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	395
250	280	55	125	125	195	190	260	260	330	370	440
280	315	55	130	130	205	200	275	275	350	410	485
315	355	65	145	145	225	225	305	305	385	455	535
355	400	100	190	190	280	280	370	370	460	510	600
400	450	110	210	210	310	310	410	410	510	565	665
450	500	110	220	220	330	330	440	440	550	625	735
500	560	120	240	240	360	360	480	480	600	690	810
560	630	140	260	260	380	380	500	500	620	780	900
630	710	145	285	285	425	425	565	565	705	865	1005
710	800	150	310	310	470	470	630	630	790	975	1135
800	900	180	350	350	520	520	690	690	860	1095	1265
900	1000	200	390	390	580	580	770	770	960	960	1150
1000	1120	220	430	430	640	640	850	850	1060	1060	1270
1120	1250	230	470	470	710	710	950	950	1190	1190	1430
1250	1400	270	530	530	790	790	1050	1050	1310	1310	1570
1400	1600	330	610	610	890	890	1170	1170	1450	1450	1730

With **NON** interchangeable component parts
Cylindrical Part Clearance to ISO 5753-2009
Radial Clearance

Clearance group symbol												
C1NA		C2NA		NA		C3NA		C4NA		C5NA		
Radial clearance of bearing μm												
min.	max.	min.	max.	min.	max.	min.	max	min.	max	min.	Max.	
0	7	8	15	15	25	30	40	40	50	-	-	
0	7	10	20	20	30	35	45	45	55	-	-	
0	10	10	20	20	30	35	45	45	55	-	-	
5	15	10	20	20	30	35	45	45	55	65	75	
5	15	10	25	25	35	40	50	50	60	70	80	
5	15	12	25	25	40	45	55	55	70	80	95	
5	18	15	30	30	45	50	65	65	80	95	110	
5	20	15	35	35	50	55	75	75	90	110	130	
10	25	20	40	40	60	70	90	90	110	130	150	
10	30	25	45	45	70	80	105	105	125	155	180	
10	30	25	50	50	80	95	120	120	145	180	205	
10	35	30	60	60	90	105	135	135	160	200	230	
10	35	35	65	65	100	115	150	150	180	225	260	
10	40	35	75	75	110	125	165	165	200	250	285	
15	45	40	80	80	120	140	180	180	220	275	315	
15	50	45	90	90	135	155	200	200	240	305	350	
15	50	50	100	100	150	170	215	215	265	330	380	
20	55	55	110	110	165	185	240	240	295	370	420	
20	60	60	120	120	180	205	265	265	325	410	470	
20	65	65	135	135	200	225	295	295	360	455	520	
25	75	75	150	150	225	255	330	330	405	510	585	
25	85	85	170	170	255	285	370	370	455	565	650	
25	95	95	190	190	285	315	410	410	505	625	720	
25	100	105	210	210	315	350	455	455	560	720	815	
30	110	115	230	230	345	390	505	505	620	800	910	
30	130	130	260	260	390	435	565	565	695	900	1030	
35	140	145	290	290	435	485	630	630	775	1000	1140	
35	160	160	320	320	480	540	700	700	860	1130	1290	
35	180	180	360	360	540	600	780	780	960	1270	1440	
50	200	200	400	400	600	660	880	880	1060	1380	1560	
60	220	220	440	440	660	730	950	950	1170	1520	1720	
60	240	240	480	480	720	810	1050	1050	1290	1680	1900	
70	270	270	540	540	810	910	1190	1190	1460	1900	2150	



Fits and internal clearances index

Other fits & internal clearances
Go to:



Deep Groove Ball Bearings



Self Aligning Ball Bearings



Angular Contact Ball Bearings



Tapered Roller Bearings



Spherical Roller Bearings

- 1) Radial clearance for bearings with tapered bore is selected from one group to the right, for example radial clearance CN for cylindrical bore bearings match C3 for tapered bore bearings.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Cylindrical bore - Clearance to ISO 5753-2009

Nominal bore diameter d		Symbol of clearance group											
		C1		C2		CN		C3		C4		C5	
mm		Radial clearance of bearing μm											
over	up to	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
14	24	0	10	10	20	20	35	35	45	45	60	60	75
24	30	0	15	15	25	25	40	40	55	55	75	75	95
30	40	0	15	15	30	30	45	45	60	60	80	80	100
40	50	0	20	20	35	35	55	55	75	75	100	100	125
50	65	0	20	20	40	40	65	65	90	90	120	120	150
65	80	5	30	30	50	50	80	80	110	110	145	145	185
80	100	5	35	35	60	60	100	100	135	135	180	180	225
100	120	5	40	40	75	75	120	120	160	160	210	210	260
120	140	5	50	50	95	95	145	145	190	190	240	240	300
140	160	10	60	60	110	110	170	170	220	220	280	280	350
160	180	10	65	65	120	120	180	180	240	240	310	310	390
180	200	10	70	70	130	130	200	200	260	260	340	340	430
200	225	10	80	80	140	140	220	220	290	290	380	380	470
225	250	15	90	90	150	150	240	240	320	320	420	420	520
250	280	15	100	100	170	170	260	260	350	350	460	460	570
280	315	15	110	110	190	190	280	280	370	370	500	500	630
315	355	20	120	120	200	200	310	310	410	410	550	550	690
355	400	20	130	130	220	220	340	340	450	450	600	600	750
400	450	20	140	140	240	240	370	370	500	500	660	660	820
450	500	20	140	140	260	260	410	410	550	550	720	720	900
500	560	20	150	150	280	280	440	440	600	600	780	780	1000
560	630	30	170	170	310	310	480	480	650	650	850	850	1100
630	710	30	190	190	350	350	530	530	700	700	920	920	1190
710	800	30	210	210	390	390	580	580	770	770	1010	1010	1300
800	900	30	230	230	430	430	650	650	860	860	1120	1120	1440
900	1000	40	260	260	480	480	710	710	930	930	1220	1220	1570



Fits and internal clearances index

Other fits & internal clearances
Go to:



Deep Groove Ball Bearings



Self Aligning Ball Bearings



Angular Contact Ball Bearings



Cylindrical Roller Bearings



Tapered Roller Bearings

Tapered bore - Clearance to ISO 5753-2009

Nominal bore diameter d		Symbol of clearance group											
		C1		C2		CN		C3		C4		C5	
mm		Radial clearance of bearing μm											
over	up to	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
18	24	5	15	15	25	25	35	35	45	45	60	60	75
24	30	10	20	20	30	30	40	40	55	55	75	75	95
30	40	15	25	25	35	35	50	50	65	65	85	85	105
40	50	15	30	30	45	45	60	60	80	80	100	100	130
50	65	25	40	40	55	55	75	75	95	95	120	120	160
65	80	30	50	50	70	70	95	95	120	120	150	150	200
80	100	30	55	55	80	80	110	110	140	140	180	180	230
100	120	40	65	65	100	100	135	135	170	170	220	220	280
120	140	50	80	80	120	120	160	160	200	200	260	260	330
140	160	55	90	90	130	130	180	180	230	230	300	300	380
160	180	65	100	100	140	140	200	200	260	260	340	340	430
180	200	70	110	110	160	160	220	220	290	290	370	370	470
200	225	70	120	120	180	180	250	250	320	320	410	410	520
225	250	90	140	140	200	200	270	270	350	350	450	450	570
250	280	90	150	150	220	220	300	300	390	390	490	490	620
280	315	100	170	170	240	240	330	330	430	430	540	540	680
315	355	120	190	190	270	270	360	360	470	470	590	590	740
355	400	130	210	210	300	300	400	400	520	520	650	650	820
400	450	140	230	230	330	330	440	440	570	570	720	720	910
450	500	160	260	260	370	370	490	490	630	630	790	790	1000
500	560	180	290	290	410	410	540	540	680	680	870	870	1100
560	630	200	320	320	460	460	600	600	760	760	980	980	1230
630	710	210	350	350	510	510	670	670	850	850	1090	1090	1360
710	800	230	390	390	570	570	750	750	960	960	1220	1220	1500
800	900	250	440	440	640	640	840	840	1070	1070	1370	1370	1690
900	1000	280	490	490	710	710	930	930	1190	1190	1520	1520	1860

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90090s

www.RollwaySmartGuide.com

Fits and internal clearances

Double Row Spherical Roller Bearings

◀ back

Reduction of radial clearance in tapered bore of double row spherical roller bearings, mounted on shaft - Clearance to ISO 5753-2009

Nominal bore diameter d		Symbol of clearance group											
		C1		C2		CN		C3		C4		C5	
mm		Radial clearance of bearing μm											
over	up to	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
50	65	0	15	15	30	30	50	50	70	70	90	90	120
65	80	0	20	20	40	40	60	60	80	80	110	110	150
80	100	0	20	20	45	45	70	70	100	100	130	130	170
100	120	0	25	25	50	50	80	80	110	110	150	150	200
120	140	0	30	30	60	60	90	90	120	120	170	170	230
140	160	0	30	30	65	65	100	100	140	140	190	190	260
160	180	0	35	35	70	70	110	110	150	150	210	210	280
180	200	0	40	40	80	80	120	120	170	170	230	230	310
200	225	0	40	40	90	90	140	140	190	190	260	260	340
225	250	0	50	50	100	100	150	150	210	210	290	290	380
250	280	0	50	50	110	110	170	170	230	230	320	320	420
280	315	0	60	60	120	120	180	180	250	250	350	350	460
315	355	0	70	70	140	140	210	210	280	280	390	390	510
355	400	0	70	70	150	150	230	230	310	310	440	440	580
400	450	0	80	80	170	170	260	260	350	350	490	490	650
450	500	0	90	90	190	190	290	290	390	390	540	540	720
500	560	0	100	100	210	210	320	320	430	430	590	590	790
560	630	0	110	110	230	230	350	350	480	480	660	660	880
630	710	0	130	130	260	260	400	400	540	540	740	740	910
710	800	0	140	140	290	290	450	450	610	610	830	830	1100
800	900	0	160	160	330	330	500	500	670	670	920	920	1240



Fits and internal clearances index

**Other fits & internal clearances
Go to:**



**Deep Groove
Ball Bearings**



**Self Aligning
Ball Bearings**



**Angular Contact
Ball Bearings**



**Cylindrical
Roller Bearings**



**Tapered
Roller Bearings**

◀ back

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90090t

www.RollwaySmartGuide.com

Fits and internal clearances

Double and Four Row Tapered Roller Bearings

Radial clearance of double and four row tapered roller bearings - Clearance to ISO 5753-2009

Nominal bore diameter d		Reduction of radial clearance		Axial displacement on 1:12 taper				Axial displacement on 1:30 taper				Check value of smallest radial clearance after mounting: clearance group		
				On the shaft		On the sleeve		On the shaft		On the sleeve				
mm														
over	up to	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	CN	C3	C4
30	40	0,02	0,025	0,35	0,4	0,35	0,45	-	-	-	-	0,015	0,025	0,04
40	50	0,025	0,03	0,4	0,45	0,45	0,5	-	-	-	-	0,02	0,03	0,05
50	65	0,03	0,04	0,45	0,6	0,5	0,7	-	-	-	-	0,025	0,035	0,055
65	80	0,04	0,05	0,6	0,75	0,7	0,85	-	-	-	-	0,025	0,04	0,07
80	100	0,045	0,06	0,7	0,9	0,75	1	1,7	2,2	1,8	2,4	0,035	0,05	0,08
100	120	0,05	0,07	0,7	1,1	0,8	1,2	1,9	2,7	2	2,8	0,05	0,065	0,1
120	140	0,065	0,09	1,1	1,4	1,2	1,5	2,7	3,5	2,8	3,6	0,055	0,08	0,11
140	160	0,075	0,1	1,2	1,6	1,3	1,7	3	4	3,1	4,2	0,055	0,09	0,13
160	180	0,08	0,11	1,3	1,7	1,4	1,9	3,2	4,2	3,3	4,6	0,06	0,1	0,15
180	200	0,09	0,13	1,4	2	1,5	2,2	3,5	4,5	3,6	5	0,07	0,1	0,16
200	225	0,1	0,14	1,6	2,2	1,7	2,4	4	5,5	4,2	5,7	0,08	0,12	0,18
225	250	0,11	0,15	1,7	2,4	1,8	2,6	4,2	6	4,6	6,2	0,09	0,13	0,2
250	280	0,12	0,17	1,9	2,6	2	2,9	4,7	6,7	4,8	6,9	0,1	0,14	0,22
280	315	0,13	0,19	2	3	2,2	3,2	5	7,5	5,2	7,7	0,11	0,15	0,24
315	355	0,15	0,21	2,4	3,4	2,6	3,6	6	8,2	6,2	8,4	0,12	0,17	0,26
355	400	0,17	0,23	2,6	3,6	2,9	3,9	6,5	9	5,8	9,2	0,13	0,19	0,29
400	450	0,2	0,26	3,1	4,1	3,4	4,4	7,7	10	8	10,4	0,13	0,2	0,31
450	500	0,21	0,28	3,3	4,4	3,6	4,8	8,2	11	8,4	11,2	0,16	0,23	0,35
500	560	0,24	0,32	3,7	5	4,1	5,4	9,2	12,5	9,6	12,8	0,17	0,25	0,36
560	630	0,26	0,35	4	5,4	4,4	5,9	10	13,5	10,4	14	0,2	0,29	0,41
630	710	0,3	0,4	4,6	6,2	5,1	6,8	11,5	15,5	12	16	0,21	0,31	0,45
710	800	0,34	0,45	5,3	7	5,8	7,6	13,3	17,5	13,6	18	0,23	0,35	0,51
800	900	0,37	0,5	5,7	7,8	6,3	8,5	14,3	19,5	14,8	20	0,27	0,39	0,57
900	1000	0,41	0,55	6,3	8,5	7	9,4	15,8	21	16,4	22	0,3	0,43	0,64
1000	1120	0,45	0,6	6,8	9	7,6	10,2	17	23	18	24	0,32	0,48	0,7
1120	1250	0,49	0,65	7,4	9,8	8,3	11	18,5	25	19,6	26	0,34	0,54	0,77
1250	1400	0,55	0,72	8,3	10,8	9,3	12,1	21	27	22,2	28,3	0,36	0,59	0,84



Fits and internal clearances index

Other fits & internal clearances
Go to:



Deep Groove Ball Bearings



Angular Contact Ball Bearings



Self Aligning Ball Bearings



Cylindrical Roller Bearings



Spherical Roller Bearings

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Shaft tolerances for Cylindrical bore bearings

Type of Load	Bearing type	Diameter	Axial Movement Magnitude of Load	Tolerance field	
Rotating Outer Ring Load	Ball & Roller Bearing	All sizes	Angular contact ball bearing and tapered roller bearing adjustment via inner ring	g6 h6 h6	(g5) (h5) (j6)
Rotating Inner Ring or indeterminate Load	Ball Bearing	Up to 40mm	normal load	J6	(j5)
		Up to 100mm	low load normal & high load	J6 k6	(j5) (k5)
		Up to 200mm	low load normal & high load	K6 m6	(k5) (m5)
		Over 200mm	normal load high load, shock load	M6 n6	(m5) (n5)
-	Roller Bearing	Up to 60mm	low load normal & high load	J6 k6	(j5) (k5)
		Up to 200mm	low load normal load high load	K6 m6 n6	(k5) (m5) (n5)
		Up to 500mm	normal load high load, shock load	m6 p6	(m5)
		Over 500mm	normal load high load	N6 p6	(n5)

Shaft tolerances for Thrust bearings

Type of Load	Bearing type	Diameter	Operating conditions	Tolerance field	
Thrust load	thrust ball bearings	all sizes		J6	
	trust ball bearings double acting	all sizes		J6	(k6)
	cylindrical roller thrust bearing	all sizes		h6	(j6)
	trust cylindrical roller & cage assembly	all sizes		h10	
	thrust cylindrical roller & cage assembly or thrust needle roller & cage assembly	all sizes		h8	
Combined Load	spherical roller thrust bearing	all sizes	point load on shaft washer	j6	
		up to 200mm	circumferential	j6	(k6)
		over 200 mm	load on shaft washer	k6	(m6)

Adapter sleeves, withdrawal sleeves

	Permissible geometrical inaccuracy (out-of-roundness taper)	Tolerance field
Adapter sleeves and withdrawal sleeves	IT 5/2	H7
	IT 5/2	h8
	IT 6/2	h9

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Shaft tolerances for adapter sleeves and withdrawal sleeves

d mm		H7			IT 5/2	h8		IT 5/2	h9		IT 6/2
μm											
over	up to	upper	lower	max.	upper	lower	max.	upper	lower	max.	
0	0	0	0	0	0	0	0	0	0	0	
6	10	0	-15	3	0	-22	3	0	-36	4.5	
10	18	0	-18	4	0	-27	4	0	-43	5.5	
18	30	0	-21	4.5	0	-39	4.5	0	-52	6.5	
30	50	0	-25	5.5	0	-39	5.5	0	-62	8	
50	80	0	-30	6.5	0	-46	6.5	0	-74	9.5	
80	120	0	-35	7.5	0	-54	7.5	0	-87	11	
120	180	0	-40	9	0	-63	9	0	-100	12.5	
180	250	0	-46	10	0	-72	10	0	-115	14.5	
250	315	0	-52	11.5	0	-81	11.5	0	-130	16	
315	400	0	-57	12.5	0	-89	12.5	0	-140	18	
400	500	0	-63	13.5	0	-97	13.5	0	-155	20	

Note: IT basic tolerances indicate accepted from circularity and cylindricity

Housing tolerances for radial bearing

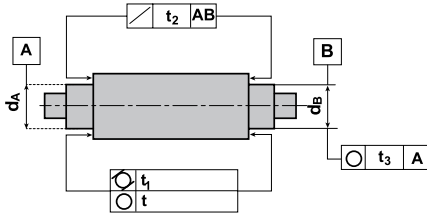
Type of Load	Axial Movement Magnitude of Load	Operation Conditions	Tolerance field	
Rotating inner Ring Load	Outer Ring slides in Housing	closeness of tolerance function of running accuracy	H7	(H6)
		high running accuracy	H7	(J6)
		standard running accuracy	H7	(J6)
		temperature increase through shaft	G7	
Rotating Outer Ring Load or indeterminate load	low load	with high running accuracy requirements K6,M6,N6 and P6	K7	(KJ6)
	normal load, shock load		M7	(M6)
	high load, shock load		N7	(N6)
	high load, heavy shock load thin-walled housings		P7	(P6)

Housing tolerances for thrust bearing

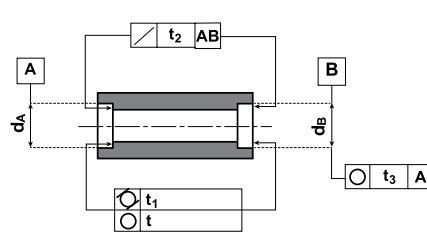
Type of load	Bearing type	Operating conditions	Tolerance field	
Thrust load	thrust ball bearings	standard running accuracy	E8	
		high running accuracy	E6	
	cylindrical roller thrust bearing		H7	(K6)
			H11	
			H10	
			H9	
	thrust cylindrical roller & cage assembly		H11	
			H10	
	spherical roller thrust bearing	normal load	E8	
		high load	G7	
Radial & axial loads on spherical roller thrust bearings	stationary load on housing washer		H7	
	rotating load on housing washer		M7	

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Accuracy of shaft



Accuracy of housing



Description	Fit	Symbol of tolerance	Allowable tolerances depending on precision classes				
			P0	P6	P5	P4(SP)	P2(UP)
Dimensional accuracy	shaft	--	IT 6	IT 5	IT 4	IT 4	IT 3
	housing		IT 7	IT 6	IT 5	IT 5	IT 4
Roundness	shaft	○ t_1	IT 4	IT 3	IT 2	IT 1	IT 0
	housing		IT 5	IT 4	IT 3	IT 2	IT 1
Cylindricity	shaft	○ t_2	IT 3	IT 3	IT 2	IT 1	IT 0
	housing		IT 4	IT 3	IT 3	IT 2	IT 1
Runout	shaft	↗ t_3	IT 3	IT 3	IT 2	IT 1	IT 0
	housing		IT 4	IT 3	IT 2	IT 2	IT 1
Eccentricity	shaft	○ t_c	IT 5	IT 4	IT 4	IT 3	IT 3
	housing		IT 6	IT 5	IT 5	IT 4	IT 3

Basic tolerance range ISO-IT

d, D		IT 0	IT 1	IT 2	IT 3	IT 4	IT 5	IT 6	IT 7	IT 8
from	to									
mm		μm								
1	3	0.5	0.8	1.2	2	2	4	6	10	14
3	6	0.6	1	1.5	2.5	4	5	8	12	18
6	10	0.6	1	1.5	2.5	4	6	9	15	22
10	18	0.8	1.2	2	3	5	8	11	18	27
18	30	1	1.5	2.5	4	6	9	13	21	33
30	50	1	1.5	2.5	4	7	11	16	25	39
50	80	1.2	2	3	5	8	13	19	30	46
80	120	1.5	2.5	4	6	10	15	22	35	54
120	180	2	3.5	5	8	12	18	25	40	63
180	250	3	4.5	7	10	14	20	28	46	72
250	315	4	6	8	12	16	23	32	52	81
315	400	5	7	9	13	18	25	36	57	89
400	500	6	8	10	15	20	27	40	63	97

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Deviation of shaft diameters 0,001 mm

Nominal diameter		g5		g6		h5		h6		h8		h10		j5	
over	inc	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
3	6	-4	-9	-4	-12	0	-5	0	-8	0	-18	0	-48	+3	-2
6	10	-5	-11	-5	-14	0	-6	0	-9	0	-22	0	-58	+4	-2
10	18	-6	-4	-6	-17	0	-8	0	-11	0	-27	0	-70	+5	-3
18	30	-7	-16	-7	-20	0	-9	0	-13	0	-33	0	-84	+5	-4
30	50	-9	-20	-9	-25	0	-11	0	-16	0	-39	0	-100	+6	-5
50	80	-10	-23	-10	-29	0	-13	0	-19	0	-46	0	-120	+6	-7
80	120	-12	-27	-12	-34	0	-15	0	-22	0	-54	0	-140	+6	-9
120	180	-14	-32	-14	-39	0	-18	0	-25	0	-63	0	-160	+7	-11
180	250	-15	-35	-15	-44	0	-20	0	-29	0	-72	0	-185	+7	-13
250	315	-17	-40	-17	-49	0	-23	0	-32	0	-81	0	-210	+7	-16
316	400	-18	-43	-18	-54	0	-25	0	-36	0	-89	0	-230	+7	-18
400	500	-20	-47	-20	-60	0	-27	0	-40	0	-97	0	-250	+7	-20

Deviation of housing diameters 0,001 mm

Nominal diameter		E8		G6		G7		H6		H7		H10		H11		J6	
over	inc	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
6	10	+47	+25	+14	+5	+20	+5	+9	0	+15	0	+58	0	+90	0	+5	-4
10	18	+59	+32	+17	+6	+24	+6	+11	0	+18	0	+70	0	+110	0	+6	-5
18	30	+73	+40	+20	+7	+28	+7	+13	0	+21	0	+84	0	+130	0	+8	-5
30	50	+89	+50	+25	+9	+34	+9	+16	0	+25	0	+100	0	+160	0	+10	-6
50	80	+106	+60	+29	+10	+40	+10	+19	0	+30	0	+120	0	+190	0	+13	-6
80	120	+126	+72	+34	+12	+47	+12	+22	0	+35	0	+140	0	+220	0	+16	-6
120	180	+148	+85	+39	+14	+54	+14	+25	0	+40	0	+160	0	+250	0	+18	-7
180	250	+172	+100	+44	+15	+61	+15	+29	0	+46	0	+185	0	+290	0	+22	-7
250	315	+191	+110	+49	+17	+69	+17	+32	0	+52	0	+210	0	+320	0	+25	-7
315	400	+214	+125	+54	+18	+75	+18	+36	0	+57	0	+230	0	+360	0	+29	-7
400	500	+232	+135	+60	+20	+83	+20	+40	0	+63	0	+250	0	+400	0	+33	-7

Deviation of shaft diameters 0,001 mm

Nominal diameter		j6		k5		k6		m5		m6		n5		n6		p6	
over	inc	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
3	6	+6	-2	+6	+1	+9	+1	+9	+4	+12	+4	+13	+8	+16	+8	+20	+12
6	10	+7	-2	+7	+1	+10	+1	+12	+6	+15	+6	+16	+10	+19	+10	+24	+15
10	18	+8	-3	+9	+	+12	+1	+15	+7	+18	+7	+20	+12	+23	+12	+29	+18
18	30	+9	-4	+11	+2	+15	+2	+17	+8	+21	+8	+24	+15	+28	+15	+35	+22
30	50	+11	-5	+13	+2	+18	+2	+20	+9	+25	+9	+28	+17	+33	+17	+42	+26
50	80	+12	-7	+15	+2	+21	+2	+24	+11	+30	+11	+33	+20	+39	+20	+51	+32
80	120	+13	-9	+18	+3	+25	+3	+28	+13	+35	+13	+38	+23	+45	+23	+59	+37
120	180	+14	-11	+21	+3	+28	+3	+33	+15	+40	+15	+45	+27	+52	+27	+66	+43
180	250	+16	-13	+24	+4	+33	+4	+37	+17	+46	+17	+51	+31	+60	+31	+79	+50
250	315	+16	-16	+27	+4	+36	+4	+43	+20	+52	+20	+57	+34	+66	+34	+88	+56
316	400	+18	-18	+29	+4	+40	+4	+46	+21	+57	+21	+62	+37	+73	+37	+98	+62
400	500	+20	-20	+32	+5	+45	+5	+50	+23	+63	+23	+67	+40	+80	+40	+108	+68

Deviation of housing diameters 0,001 mm

Nominal diameter		J7		K6		K7		M6		M7		N6		N7		P6		P5	
over	inc	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
6	10	+8	-7	+2	-7	+5	-10	-3	-12	0	-15	-7	-16	-4	-19	-12	-21	-9	-24
10	18	+10	-8	+2	-9	+6	-12	-4	-15	0	-18	-9	-20	-5	-23	-15	-26	-11	-29
18	30	+12	-9	+2	-11	+6	-15	-4	-17	0	-21	-11	-24	-7	-28	-18	-31	-14	-35
30	50	+14	-11	+3	-13	+7	-18	-4	-20	0	-25	-12	-28	-8	-33	-21	-37	-17	-42
50	80	+18	-12	+4	-15	+9	-21	-5	-24	0	-30	-14	-33	-9	-39	-26	-45	-21	-51
80	120	+22	-13	+4	-18	+10	-25	-6	-28	0	-35	-16	-38	-10	-45	-30	-52	-24	-59
120	180	+26	-14	+4	-21	+12	-28	-8	-33	0	-40	-20	-45	-12	-52	-36	-61	-28	-68
180	250	+30	-16	+5	-24	+13	-33	-8	-37	0	-46	-22	-51	-14	-60	-41	-70	-33	-79
250	315	+36	-16	+5	-27	+16	-36	-9	-41	0	-52	-25	-57	-14	-66	-47	-79	-36	-88
315	400	+39	-18	+7	-29	+17	-40	-10	-46	0	-57	-26	-62	-16	-73	-51	-87	-41	-98
400	500	+43	-20	+8	-32	+18	-45	-10	-50	0	-63	-27	-67	-17	-80	-55	-95	-45	-108

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

FITS

Tolerances for the boundary dimensions of bearings are to ISO standards. To ensure satisfactory performance of the bearing under variable operating conditions, it is necessary to select suitable fits between the inner ring and the shaft and the outer ring and the housing.

When selecting the correct fits from the ISO range of shaft and housing tolerances, it is necessary to consider adequate radial support of the bearing, ease of mounting and dismounting, and allowance for axial movement of the free bearing.

Selection of the fit also depends on the loading on the bearing and on the operating temperature. It should be noted that tight fits reduce the internal clearance of the bearing, and allowance should be made when selecting the bearing clearance.

TOLERANCES

The boundary dimensions and tolerances of rolling bearings have been standardized by ISO. Bearings are manufactured to normal class 0 tolerances, unless otherwise stated.

Tolerances are also listed for the closer-than-normal limits required, for example, in machine tool and high speed applications.

The more common ISO norms referred to are as follows:

ISO 15-2011 –	Rolling bearings – Radial bearings – Boundary dimensions
ISO 104-2002 –	Thrust bearings with flat housing washers – Boundary dimensions
ISO 199-2005 –	Rolling bearings – Thrust ball bearings – Tolerances
ISO 355-2007 –	Metric tapered roller bearing - Boundary dimensions
ISO 464-2002 –	Rolling bearings with locating snap ring – Dimensions
ISO 492-2002 –	Radial bearings – Tolerances
ISO 1132-2001 –	Rolling bearings – Tolerances – Definitions
ISO 5753-2009 –	Rolling bearings – Radial internal clearances

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Introduction

The dimensional and running accuracies of our bearings are standardized according to ISO.

Precision Class
Radial Bearing

Precision Class
Tapered Roller
Bearing

Precision Class
Thrust Bearing

Rolling Bearing Tolerance Symbol

Bore Diameter

d	Nominal bore diameter
d1	Nominal large diameter of tapered bore
ds	Single bore diameter
Δds	Deviation of a single bore diameter
$\sqrt{ds}$	Bore diameter variation
Dm	Mean bore diameter
Δdm	Mean bore diameter deviation
Dmp	Single plane mean bore diameter
Δdmp	Single plane mean bore diameter deviation
$\Delta d1mp$	Deviation of mean large diameter from nominal-tapered bore
V_{DP}	Bore diameter variation in a single radial plane
V_{DMP}	Mean bore diameter variation
α	Taper angle

Outside Diameter

D	Nominal outside diameter
Ds	Single outside diameter
$\sqrt{Ds}$	Deviation of a single outside diameter
Dm	Mean outside diameter
ΔDm	Mean outside diameter deviation
Dmp	Single plane mean outside diameter
ΔDmp	Single plane outside diameter deviation
V_{DP}	Outside diameter variation in a single radial plane
V_{DMP}	Mean outside diameter variation

Width And Height

B	Nominal inner ring width
V	Nominal outer ring width
Bs	Single inner ring width
Cs	Single outer ring width
ΔBs	Deviation of a single inner ring width
ΔCs	Deviation of a single outer ring width
$\sqrt{Bs}$	inner ring width variation
$\sqrt{Cs}$	Outer ring width variation
Bm	Mean inner ring width

Radial Run Out

Kla	Radial run out of assembled bearing inner ring
Kea	Radial run out of assembled bearing outer ring
Sd	Face run out with bore
SD	Variation of outside surface inclination with face
Sla	Assembled bearing inner ring face run out with raceway
Sea	Assembled bearing outer ring face run out with raceway
D1	Nominal diameter of outer ring flange
T	Nominal width of tapered roller bearing
ΔTs	Deviation in width of tapered roller bearing at single position
T1	Nominal width of tapered roller bearing-cone
$\Delta T1s$	Deviation of width of tapered roller bearing-cone
T2	Nominal width of tapered roller bearing-cup
$\Delta T2s$	Deviation of width of tapered roller bearing-cup
d2	Nominal shaft washer diameter – double acting thrust bearing
$\Delta d2p$	Deviation of shaft washer mean bore diameter single plane
Dw	Nominal diameter of roller
Dwm	Mean diameter of roller
Lw	Nominal length of roller

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Precision class P0 - Inner ring

d mm		Δdmp		V _{dp} Diameter ranges			V _{dmp}	K _{ia}	ΔBs				V _{Bs}
				7,8,9	0,1	2,3,4					Modified ²		
over	up to	upper	lower	max.			max.	max.	upper	lower	upper	lower	max.
0,6 ¹⁾	2,5	0	-8	10	8	6	6	10	0	-40	-	-	12
2,5	10	0	-8	10	8	6	6	10	0	-120	0	-250	15
10	18	0	-8	10	8	6	6	10	0	-120	0	-250	20
18	30	0	-10	13	10	8	8	13	0	-120	0	-250	20
30	50	0	-12	15	12	9	9	15	0	-120	0	-250	20
50	80	0	-15	19	19	11	11	20	0	-150	0	-380	25
80	120	0	-20	25	25	15	15	25	0	-200	0	-380	25
120	180	0	-25	31	31	19	19	30	0	-250	0	-500	30
180	250	0	-30	38	38	23	23	40	0	-300	0	-500	30
250	315	0	-35	44	44	26	26	50	0	-350	0	-500	35
315	400	0	-40	50	50	30	30	60	0	-400	0	-500	40
400	500	0	-45	56	56	34	34	65	0	-450	0	-630	50
500	630	0	-50	63	63	38	38	70	0	-500	-	-	60
630	800	0	-75	-	-	-	-	80	0	-750	-	-	70
800	1000	0	-100	-	-	-	-	90	0	-1000	-	-	80
1000	1250	0	-125	-	-	-	-	100	0	-1250	-	-	100
1250	1600	0	-160	-	-	-	-	120	0	-1600	-	-	120
1600	2000	0	-200	-	-	-	-	140	0	-2000	-	-	140
-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tolerances in μm

- 1) Including this dimension
- 2) Only for bearings mounted in sets

Outer ring

continue ►

D mm		ΔDmp		V _{dp2} Open Bearings Diameter ranges			Sealed bearings	V _{dmp2}	K _{ea}	ΔCs	VCs
				7,8,9	0,1	2,3,4					
over	up to	upper	lower	max.			max.	max.	max.		
2,5 ¹⁾	6	0	-8	10	8	6	10	6	10	Identical with ΔBs and VBs of the inner ring of the same bearing	
6	18	0	-8	10	8	6	10	6	10		
18	30	0	-9	12	9	7	12	6	10		
30	50	0	-11	14	11	8	16	8	13		
50	80	0	-13	16	13	10	20	9	15		
80	120	0	-15	19	19	11	26	11	20		
120	150	0	-18	23	23	14	30	15	25		
150	180	0	-25	31	31	19	38	19	30		
180	250	0	-30	38	38	23	-	23	40		
250	315	0	-35	44	44	26	-	26	50		
315	400	0	-40	50	50	30	-	30	60		
400	500	0	-45	56	56	34	-	34	65		
500	630	0	-50	63	63	38	-	38	70		
630	800	0	-75	94	94	55	-	-	80		
800	1000	0	-100	125	125	75	-	-	90		
1000	1250	0	-125	-	-	-	-	-	100		
1250	1600	0	-160	-	-	-	-	-	120		
1600	2000	0	-200	-	-	-	-	-	-		
2000	2500	0	-250	-	-	-	-	-	140		

Tolerances in μm

- 1) Including this dimension
- 2) Main diameter variation before fitting snap rings

Precision Class Radial Bearings with Tapered bore

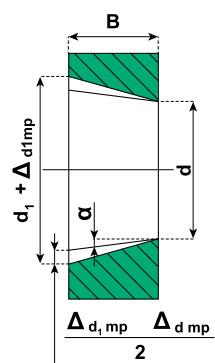
Precision class P0

Tolerances in μm

d mm		$\Delta d_{mp}^{1)}$		$\Delta d_{1mp} - \Delta d_{mp}^{2)}$		$\sqrt{dp}^{3)}$
		upper	lower	upper	lower	
-	10	+15	0	+15	0	10
10	18	+18	0	+18	0	10
18	30	+21	0	+21	0	13
30	50	+25	0	+25	0	15
50	80	+30	0	+30	0	19
80	120	+35	0	+35	0	25
120	180	+40	0	+40	0	31
180	250	+46	0	+46	0	38
250	315	+52	0	+52	0	44
315	400	+57	0	+57	0	50
400	500	+63	0	+63	0	56

- 1) Single plane main bore diameter deviation at smallest theoretical opening
- 2) Main diameter deviation of large diameter less main diameter deviation from smaller diameter
- 3) Bore diameter variation in a single radial plane

Tolerances For Tapered Bores – Taper 1:12
Nominal dimensions



$$\alpha = 2^{\circ}23'9,4'' = 2.38594^{\circ} = 0.041643 \text{ rad}$$

half the angle of taper

continue ►

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90355e
www.RollwaySmartGuide.com

Precision class radial bearings

Metric size - Precision class P6 - P5 - P4

Precision class
Tolerance Symbols
Index

Precision class P6 - Inner ring

Outer ring

back

d mm		Δdmp		V _{dp} Diameter ranges			V _{dmp}	K _{ia}	ΔBs				VBs
				7,8,9	0,1	2,3,4					modified ²⁾		
over	up to	upper	lower	max.			max.	max.	upper	lower	upper	lower	max.
0,6 ¹⁾	2,5	0	-7	9	7	5	5	5	0	-40	-	-	12
2,5	10	0	-7	9	7	5	5	6	0	-120	0	-250	15
10	18	0	-7	9	7	5	5	7	0	-120	0	-250	20
18	30	0	-8	10	8	6	6	8	0	-120	0	-250	20
30	50	0	-10	13	10	8	8	10	0	-120	0	-250	20
50	80	0	-12	15	15	9	9	10	0	-150	0	-380	25
80	120	0	-15	19	19	11	11	13	0	-200	0	-380	25
120	180	0	-18	23	23	14	14	18	0	-250	0	-500	30
180	250	0	-22	28	28	17	17	20	0	-300	0	-500	30
250	315	0	-25	31	31	19	19	25	0	-350	0	-500	35
315	400	0	-30	38	38	23	23	30	0	-400	0	-630	40
400	500	0	-35	44	44	26	26	35	0	-450	-	-	50
500	630	0	-40	50	50	30	30	40	0	-500	-	-	60
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-

D mm		ΔD_{mp}		V_{Dp} ²⁾ Open Bearings Diameter ranges			Sealed bearings	V_{Dmp} ²⁾	K_{ea}	ΔCs	VCs
				7,8,9	0,1	2,3,4					
				max.			max.	max.	max.		
2,5 ¹⁾	6	0	-7	9	7	5	9	5	8	Identical with ΔBs and VBs of the inner ring of the same bearing	
6	18	0	-7	9	7	5	9	5	8		
18	30	0	-8	10	8	6	10	6	9		
30	50	0	-9	11	9	7	13	7	10		
50	80	0	-11	14	11	8	16	8	13		
80	120	0	-13	16	16	10	20	10	18		
120	150	0	-15	19	19	11	25	11	20		
150	180	0	-18	23	23	14	30	14	23		
180	250	0	-20	25	25	15	-	15	25		
250	315	0	-25	31	31	19	-	19	30		
315	400	0	-28	35	35	21	-	21	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	1000	0	-60	75	75	45	-	45	75		

1) Including this dimension

2) Only for bearings mounted in sets

Tolerances in μm

Tolerances in μm

Precision class P5 - Inner ring

Precision class P5 - Outer ring

d mm		cylindrical bore			Δds		tapered bore				ΔBs	▽Bs	K _{ia}	Sd	Sia
		Δdmp, Δds ▽dp					V _{dp} Δd1mp - Δdmp								
from	to	lower	upper	max.	lower	upper	max.	lower	upper	lower	upper	max.	max.	max.	max.
18	30	-6	0	3	0	+10	3	0	+4	-100	0	5	3	8	8
30	50	-8	0	4	0	+12	4	0	+6	-120	0	5	4	8	8
50	80	-9	0	5	0	+15	5	0	+6	-150	0	6	4	8	8
80	120	-10	0	5	0	+20	5	0	+8	-200	0	7	5	9	9
120	180	-13	0	7	0	+25	7	0	+8	-250	0	8	6	10	10
180	250	-15	0	8	0	+30	8	0	+10	-300	0	10	8	11	13
250	315	-15	0	9	0	+35	9	0	+12	-350	0	13	8	13	15
315	400	-23	0	12	0	+40	12	0	+12	-400	0	15	10	15	20
400	500	-27	0	14	0	+45	14	0	+14	-400	0	17	10	17	23
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tolerances in μm

D mm		$\Delta D_{mp}, \Delta Ds$		V_{Dp}	K_{ea}	SD	Sea
		from	to	lower	upper	max.	max.
30	50	-7	0	4	5	8	8
50	80	-9	0	5	5	8	10
80	120	-10	0	5	6	9	11
120	150	-11	0	6	7	10	13
150	180	-13	0	7	8	10	14
180	250	-15	0	8	10	11	15
250	315	-18	0	9	11	13	18
315	400	-20	0	10	13	13	20
400	500	-23	0	12	15	15	23
500	630	-28	0	14	17	18	25
630	800	-35	0	18	20	20	30

Tolerances in μm

Precision class P4 - Inner ring

Precision class UP - Outer ring

d mm		cylindrical bore			Δds		tapered bore				ΔBs	▽Bs	K _{ia}	Sd	Sia
		Δdmp, Δds V _{d_p}					V _{d_p} Δd1mp - Δdmp								
from	to	lower	upper	max.	lower	upper	max.	lower	upper	lower	upper	max.	max.	max.	
18	30	-5	0	2.5	0	+6	2.5	0	+2	-25	0	1.5	3	3	
30	50	-6	0	3	0	+7	3	0	+3	-30	0	2	3	3	
50	80	-7	0	3.5	0	+8	3.5	0	+3	-40	0	3	4	3	
80	120	-8	0	4	0	+10	4	0	+4	-50	0	3	4	4	
120	180	-10	0	5	0	+12	5	0	+4	-60	0	4	5	6	
180	250	-12	0	6	0	+14	6	0	+5	-75	0	5	6	7	
250	315	-15	0	8	0	+15	8	0	+6	-100	0	5	6	8	
315	400	-19	0	10	0	+17	10	0	+6	-100	0	6	7	9	
400	500	-23	0	12	0	+19	12	0	+7	-100	0	7	8	10	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Tolerances in μm

D mm		$\Delta D_{mp}, \Delta Ds$		V_{Dp}	K_{ea}	SD	Sea
		from	to	lower	upper	max.	max.
30	50	-5	0	3	3	2	4
50	80	-6	0	3	3	2	4
80	120	-7	0	4	3	3	5
120	150	-8	0	4	4	3	6
150	180	-9	0	5	4	3	7
180	250	-10	0	5	5	4	9
250	315	-12	0	6	6	4	9
315	400	-14	0	7	7	5	12
400	500	-17	0	9	8	5	12
500	630	-20	0	10	9	6	14
630	800	-25	0	13	11	7	17

Tolerances in μm

back

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90355f

www.RollwaySmartGuide.com

Precision class Tapered Roller Bearing

Metric size - Precision class P0

Precision class
Tolerance Symbols
Index

Precision class P0 - Inner ring

d mm		ΔD_{mp}		$\sqrt{dp}$	$\sqrt{dmp}$	K_{ia}
over	up to	upper	lower	max.	max.	max.
10	18	0	-12	12	9	15
18	30	0	-12	12	9	18
30	50	0	-12	12	9	20
50	80	0	-15	15	11	25
80	120	0	-20	20	15	30
120	180	0	-25	25	19	35
180	250	0	-30	30	23	50
250	315	0	-35	35	26	60
315	400	0	-40	40	30	70
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Tolerances in μm

Outer ring

continue ►

D mm		ΔD_{mp}		$\sqrt{Dp}$	$\sqrt{Dmp}$	K_{ea}
over	up to	upper	lower	max.	max.	max.
18	30	0	-12	12	9	18
30	50	0	-14	14	11	20
50	80	0	-16	16	12	25
80	120	0	-18	18	14	35
120	150	0	-20	20	15	40
150	180	0	-25	25	19	45
180	250	0	-30	30	23	50
250	315	0	-35	35	26	60
315	400	0	-40	40	30	70
400	500	0	-45	45	34	80
500	630	0	-50	50	38	100

Tolerances in μm

Note: the limit tolerance of the outer diameter D1 of a flanged bearing is h9

Precision class P0 - With of inner, outer ring and height

d mm		$\Delta BS, \Delta CS$		ΔTS		$\Delta T1S$		$\Delta T2S$	
over	up to	upper	lower	upper	lower	upper	lower	upper	lower
10	18	0	-120	+120	0	+100	0	+100	0
18	30	0	-120	+200	0	+100	0	+100	0
30	50	0	-120	+200	0	+100	0	+100	0
50	80	0	-150	+200	0	+100	0	+100	0
80	120	0	-200	+200	-200	+100	-100	+100	-100
120	180	0	-250	+350	-250	+150	-150	+200	-100
180	250	0	-300	+350	-250	+150	-150	+200	-100
250	315	0	-350	+350	-250	+150	-150	+200	-100
315	400	0	-400	+400	-400	+200	-200	+200	-200

Tolerances in μm

Precision class P6X

D mm		ΔBs		ΔCs		ΔTs		$\Delta T1s$		$\Delta T2s$	
over	up to	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower
10	18	0	-50	0	-100	+100	0	+50	0	+50	0
18	30	0	-50	0	-100	+100	0	+50	0	+50	0
30	50	0	-50	0	-100	+100	0	+50	0	+50	0
50	80	0	-50	0	-100	+100	0	+50	0	+50	0
80	120	0	-50	0	-100	+100	0	+50	0	+50	0
120	180	0	-50	0	-100	+150	0	+50	0	+100	0
180	250	0	-50	0	-100	+150	0	+50	0	+100	0
250	315	0	-50	0	-100	+200	0	+100	0	+100	0
315	400	0	-50	0	-100	+200	0	+100	0	+100	0

Tolerances in μm

The limit tolerances for The diameter and The radial run-out of The outer ring and The inner ring in this precision class are The same with precision class P0.

The limit tolerances for the width and mounting height for the outer and inner ring are those indicated below.

continue ►

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

Precision class P5 - Inner ring

d mm		Δdmp		V _{dp}	VD _{MP}	K _{ia}	S _d	ΔBs		ΔTs	
over	up to	upper	lower	max.	max.	max.	max.	upper	lower	upper	lower
10	18	0	-7	5	5	5	7	0	-200	+200	-200
18	30	0	-8	6	5	5	8	0	-200	+200	-200
30	50	0	-10	8	5	6	8	0	-240	+200	-200
50	80	0	-12	9	6	7	8	0	-300	+200	-200
80	120	0	-15	11	8	8	9	0	-400	+200	-200
120	180	0	-18	14	9	11	10	0	-500	+350	-250
180	250	0	-22	17	11	13	11	0	-600	+350	-250
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Tolerances in μm

Outer ring

D mm		ΔDmp		V _{dp}	VD _{MP}	K _{ea}	S _D	ΔCs
over	up to	upper	lower	max.	max.	max.	max.	
18	30	0	-8	6	5	6	8	Identical with ΔBs of the inner ring of the same bearing
30	50	0	-9	7	5	7	8	
50	80	0	-11	8	6	8	8	
80	120	0	-13	10	7	10	9	
120	150	0	-15	11	8	11	10	
150	180	0	-18	14	9	13	10	
180	250	0	-20	15	10	15	11	
250	315	0	-25	19	13	18	13	
315	400	0	-28	22	14	20	13	

Tolerances in μm

The limit tolerance of the outer diameter D₁ of a flanged bearing is h9.

Precision class P4 - Inner ring

d mm		Δdmp, ds		V _{dp}	VD _{MP}	K _{ia}	S _d	S _{ia}	ΔBs		ΔTs	
over	up to	upper	lower	max.	max.	max.	max.	max.	upper	lower	upper	lower
10	18	0	-5	4	4	3	3	3	0	-200	+200	-200
18	30	0	-6	5	4	3	4	4	0	-200	+200	-200
30	50	0	-8	6	5	4	4	4	0	-240	+200	-200
50	80	0	-9	7	5	4	4	4	0	-300	+200	-200
80	120	0	-10	8	5	5	5	5	0	-400	+200	-200
120	180	0	-13	10	7	6	7	7	0	-500	+350	-250
180	250	0	-15	11	8	8	8	8	0	-600	+350	-250
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Tolerances in μm

Outer ring

D mm		ΔDmp, ΔDs		V _{dp}	VD _{MP}	K _{ea}	S _D	S _{ea}	ΔCs	
over	up to	upper	lower	max.	max.	max.	mas.	max.	Upper / lower	
18	30	0	-6	5	4	4	4	5	Identical with ΔBs of the inner ring of the same bearing	
30	50	0	-7	5	5	5	4	5		
50	80	0	-9	7	5	5	4	5		
80	120	0	-10	8	5	6	5	6		
120	150	0	-11	8	6	7	5	7		
150	180	0	-13	10	7	8	5	8		
180	250	0	-15	11	8	10	7	10		
250	315	0	-18	14	9	11	8	10		
315	400	0	-20	15	10	13	10	13		

Tolerances in μm

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90355k

www.RollwaySmartGuide.com

Precision class Tapered Roller Bearings

Inch size – Precision according AFBMA standard

Precision class
Tolerance Symbols
Index

◀ back

Inner ring

d mm		Precision classes									
		4		2		3		0		00	
over	up to	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower
-	76.2	+13	0	+13	0	+13	0	+13	0	+8	0
76.2	304.2	+25	0	+25	0	+13	0	+13	0	+8	0
304.2	609.6	+51	0	+51	0	+25	0	-	-	-	-
609.6	914.4	+76	0	-	-	+38	0	-	-	-	-
914.4	1219.2	+102	0	-	-	+51	0	-	-	-	-
1219.2	-	+127	0	-	-	+76	0	-	-	-	-

Tolerances in µm

Outer ring

D mm		Precision classes									
		4		2		3		0		00	
over	up to	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower
-	304.8	+25	0	+25	0	+13	0	+13	0	+8	0
304.8	609.6	+51	0	+51	0	+25	0	-	-	-	-
609.6	912.4	+76	0	+76	0	+38	0	-	-	-	-
914.4	1219.2	+102	0	-	-	+51	0	-	-	-	-
1219.2	-	+127	0	-	-	+76	0	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Tolerances in µm

Radial run-out of an assembled bearings

d mm		Precision classes				
		4	2	3	0	00
over	up to	max.	max.	max.	max.	max.
-	304.8	51	38	8	4	2
304.8	609.6	51	38	18	-	-
609.6	914.4	76	51	51	-	-
914.4	-	76	-	76	-	-
-	-	-	-	-	-	-

Tolerances in µm

Tolerances for mounting height ΔTs

d mm		D mm		Precision classes									
				4		2		3		0		00	
over	up to	over	up to	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower
-	101.6			+203	0	+203	0	+203	-203	+203	-203	+203	-203
101.6	304.8			+356	-254	+203	0	+203	-203	+203	-203	+203	-203
304.8	609.6	-	508.0	+318	-381	+381	-381	+203	-203	-	-	-	-
304.8	609.6	508.0		+318	-381	+318	-381	+381	-381	-	-	-	-
609.6	-			+318	-381	-	-	+381	-381	-	-	-	-

Tolerances in µm

Tolerances for the mounting height on the inner ring roller sub-assembly with outer ring (ΔT1S)

d mm		D mm		Precision classes									
				4		2		3		0		00	
over	up to	over	up to	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower
-	101.6			+102	0	+102	0	+102	-102	+102	-102	+102	-102
101.6	304.8			+152	-152	+102	0	+102	-102	+102	-102	+102	-102
304.8	609.6		508.0	+178	-178	+178	-178	+102	-102	-	-	-	-
304.8	609.6	508.0	-	+178	-178	+178	-178	+178	-178	-	-	-	-
609.6	-			+178	-178	-	-	+178	-178	-	-	-	-

Tolerances in µm

Tolerances for the mounting height on the inner ring roller sub-assembly with outer ring (ΔT2S)

d mm		D mm		Precision classes									
				4		2		3		0		00	
over	up to	over	up to	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower
-	101.6			+102	0	+102	0	+102	-102	+102	-102	+102	-102
101.6	304.8			+203	-102	+102	0	+102	-102	+102	-102	+102	-102
304.8	609.6		508.0	+203	-203	+203	-203	+102	-102	-	-	-	-
304.8	609.6	508.0	-	+203	-203	+203	-203	+203	-203	-	-	-	-
609.6	-			+203	-203	-	-	+203	-203	-	-	-	-

Tolerances in µm

◀ back

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



90355m

www.RollwaySmartGuide.com

Precision class Thrust Bearing

Metric size - Precision class P5 - P6

Precision class
Tolerance Symbols
Index

Single acting thrust bearing (single row)

Shaft Washer

d mm		P0; P6; P5			P4; P2		
		Δd_{mp} Δd_{2mp}		V_{dp} VD_{zP}	Δd_{mp} Δd_{2mp}		V_{dp} VD_{zP}
over	up to	upper	lower	max.	upper	lower	max.
-	18	0	-8	6	0	-7	5
18	30	0	-10	8	0	-8	6
30	50	0	-12	9	0	-10	8
50	80	0	-15	11	0	-12	9
80	120	0	-20	15	0	-15	11
120	180	0	-25	19	0	-18	14
180	250	0	-30	23	0	-22	17
250	315	0	-35	26	0	-25	19
315	400	0	-40	30	0	-30	23
400	500	0	-45	34	0	-35	26
500	630	0	-50	38	0	-40	30
630	800	0	-75	-	0	-50	-
800	1000	0	-100	-	-	-	-
1000	1250	0	-125	-	-	-	-
-	-	-	-	-	-	-	-

Tolerances in μm

Housing Washer

d mm		P0; P6; P5			P4; P2		
		VD_{MP}		V_{dp}	Δd_{mp}		V_{dp}
over	up to	upper	lower	max.	upper	lower	max.
10	18	0	-11	8	0	-7	5
18	30	0	-13	10	0	-8	6
30	50	0	-16	12	0	-9	7
50	80	0	-19	14	0	-11	8
80	120	0	-22	17	0	-13	10
120	180	0	-25	19	0	-15	11
180	250	0	-30	23	0	-20	15
250	315	0	-35	26	0	-25	19
315	400	0	-40	30	0	-28	21
400	500	0	-45	34	0	-33	25
500	630	0	-50	38	0	-38	29
630	800	0	-75	55	0	-45	34
800	1000	0	-100	75	0	-	-
1000	1250	0	-125	-	0	-	-
1250	1600	0	-160	-	0	-	-

Tolerances in μm

Double acting thrust bearing (double row)

Precision class P5 and P6 - Inner ring

d mm		P5					P6			P5 and P6			
		Δdmp		Δds		Sia	Δds		Sia	Hs		Cs	
over	up to	upper	lower	upper	lower	max.	upper	lower	max.	upper	lower	upper	lower
16	18	0	-7	+1	-8	3	0	-5	1.5	+50	-80	0	-30
18	30	0	-8	+1	-9	3	0	-6	1.5	+50	-80	0	-30
30	50	0	-10	+1	-11	3	0	-8	1.5	+60	-100	0	-30
50	80	0	-12	+2	-14	4	0	-9	2	+70	-120	0	-30
80	120	0	-15	+3	-18	4	0	-10	2	+85	-140	0	-30
120	180	0	-18	+3	-21	5	0	-13	3	+95	-160	0	-30
180	250	0	-22	+4	-26	5	0	-15	3	+120	-200	0	-30

Tolerances in μm

Precision class P5 and P6 - Outer ring

D mm		SP and UP		
		ΔDS	Sea	
over	up to	upper	lower	max.
30	50	-20	-27	Identical with the inner ring of the same bearing
50	80	-24	-33	
80	120	-28	-38	
120	150	-33	-44	
150	180	-33	-46	
180	250	-37	-52	
250	315	-41	-59	

Tolerances in μm

Single & Double acting thrust bearing

d* mm		Si					Se
		P0;	P6;	P5;	P4;	P2	P0; P6; P5; P4; P2
over	up to	max.	max.	max.	max.	max.	max.
-	18	10	5	3	2	1	Identical with S1 of the shaft washer
18	30	10	5	3	2	1.2	
30	50	10	6	3	2	1.5	
50	80	10	7	4	3	2	
80	120	15	8	4	3	2	
120	180	15	9	5	4	3	
180	250	20	10	5	4	3	
250	315	25	13	7	5	4	
315	400	30	15	7	5	4	
400	500	30	18	9	6	-	
500	630	35	21	11	7	-	
630	800	40	25	13	8	-	
800	1000	45	30	15	-	-	
1000	1250	50	35	18	-	-	

Tolerances in μm

Values for S_i and S_e for double-acting thrust bearings are equal to the values corresponding to single-acting thrust bearings and are depending on the bore diameter d, of single-acting bearings.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

**Deep Groove
Ball Bearings**

**Self Aligning
Ball Bearings**

**Cylindrical
Roller Bearings**
Single Row

**Angular
Contact Bearings**
Single Row

Filet Radii

The bearing tables give the maximum fillet radius which the bearing will clear.

A fillet radius which is too large can cause distortion of the bearing ring, and may cause misalignment of the bearing relative to the seating.

Abutment Shoulders

These must be flat, aligned with the axis of rotation, and free from burrs, to maintain bearing alignment and give proper support to the bearing faces.

Minimum Abutment Diameter

Minimum abutment diameters for bearings not subject to significant axial load are:

Inner ring abutment = $d + 4r$ (maximum)

Outer ring abutment = $D - 4r$ (minimum)

where:

d = bearing bore diameter

r = fillet radius (from bearing tables)

D = bearing outside diameter

Maximum Abutment Diameters

The normal recommendations concerning maximum abutments for radial ball and standard cylindrical roller bearings are given in tables.

It may not always be possible for small bearings to satisfy the minimum abutment recommendations, and in such cases the abutment should be made to the maximum figure in the table.

Abutments For Thrust Bearings

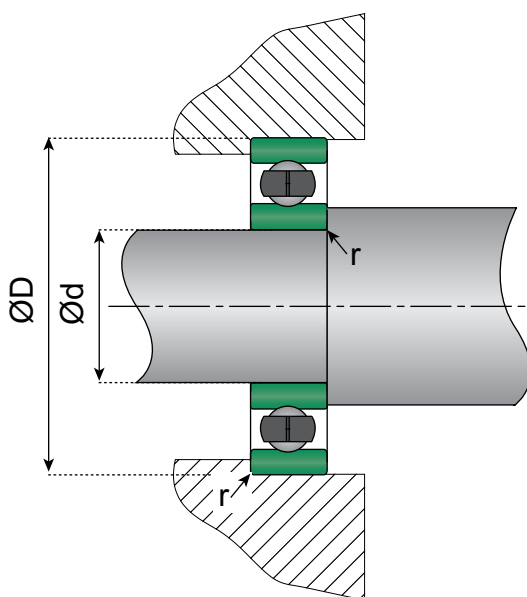
Thrust bearing abutments must be accurately machined flat and aligned with the axis of rotation, as any misalignment will induce creep. The thrust bearing washers should be supported beyond the pitch diameter of the ball assembly. This may be calculated as:

$$Pcd = (d+D)/2$$

where:

d = small bore diameter

D = large outside diameter



Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®

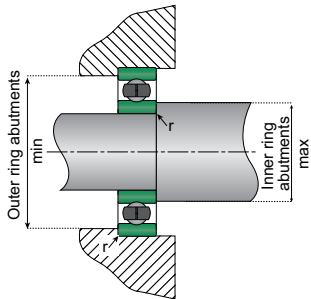


90372a

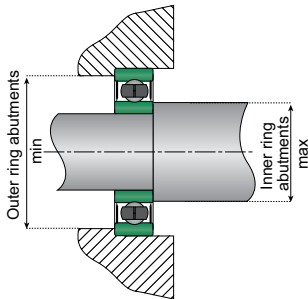
www.RollwaySmartGuide.com

Abutments

Deep Groove Ball Bearings



Open version



ZZ & 2RS version



Series 600	Inner ring abutment mm	Outer ring abutment mm	Series 600 ZZ-2RS	Inner ring abutment mm	Outer ring abutment mm
607	9.4	15.8	607 ZZ-2RS	9.4	16.5
608	11.0	19.0	608 ZZ-2RS	10.5	19.5
609	12.8	20.7	609 ZZ-2RS	12.8	21.2
623	4.8	7.9	623 ZZ-2RS	4.8	8.8
624	6.4	11.1	624 ZZ-2RS	6.4	11.3
625	6.8	13.2	625 ZZ-2RS	6.8	13.9
626	9.4	15.8	626 ZZ-2RS	9.0	16.5
627	11.1	19.0	627 ZZ-2RS	10.5	19.5
629	13.2	22.8	629 ZZ-2RS	12.5	23.5
634	6.8	13.2	634 ZZ-2RS	6.8	13.9
635	9.4	15.8	635 ZZ-2RS	9.0	16.5
636	11.1	19.0	636 ZZ-2RS	10.5	19.5

Abutments other version
Deep groove Ball Bearing

Series
6200-6300

General
Guidelines

Series 6000 ZZ-2RS	Inner ring abutment mm	Outer ring abutment mm
6000 ZZ-2RS	12.5	23.0
6001 ZZ-2RS	14.5	25.0
6002 ZZ-2RS	18.0	28.5
6003 ZZ-2RS	20.5	31.5
6004 ZZ-2RS	30.0	42.0
6005 ZZ-2RS	30.0	42.0
6006 ZZ-2RS	35.5	50.0
6007 ZZ-2RS	41.0	56.5
6008 ZZ-2RS	46.0	62.0
6009 ZZ-2RS	51.5	70.0
6010 ZZ-2RS	57.0	74.5
6011 ZZ-2RS	63.0	82.5
6012 ZZ-2RS	67.5	88.0
6013 ZZ-2RS	73.0	92.5
6014 ZZ-2RS	78.5	102.0

Series 16000	Inner ring abutment mm	Outer ring abutment mm
16000	12.5	23.0
16001	15.0	25.0
16002	18.5	29.0
16003	20.0	32.0
16004	30.0	42.0
16005	30.0	42.0
16006	36.0	49.0
16007	42.0	55.0
16008	47.0	60.5
16009	52.5	67.5
16010	57.5	72.5
16011	64.5	80.5
16012	69.5	85.5
16013	74.5	90.5
16014	80.0	100.0
16015	85.0	105.0
16016	92.0	113.0
16017	97.0	118.0
16018	103.0	127.0

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

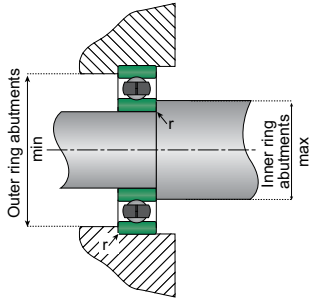
ROLLWAY®



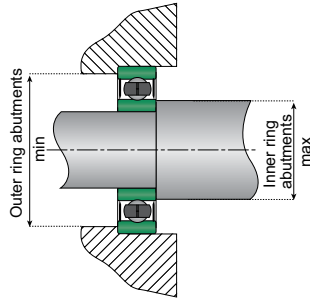
90372c
www.RollwaySmartGuide.com

Abutments

Deep Groove Ball Bearings



Open version



ZZ & 2RS version



Series 6200	Inner ring abutment mm	Outer ring abutment mm	Series 6200 ZZ-2RS	Inner ring abutment mm	Outer ring abutment mm
6200	15.0	25.5	6200 ZZ-2RS	15.0	26.0
6201	16.5	28.0	6201 ZZ-2RS	16.0	28.0
6202	19.5	31.0	6202 ZZ-2RS	19.0	31.0
6203	22.0	35.0	6203 ZZ-2RS	22.0	35.5
6204	26.0	41.0	6204 ZZ-2RS	26.0	42.5
6205	31.0	46.5	6205 ZZ-2RS	31.0	47.5
6206	37.5	55.5	6206 ZZ-2RS	37.5	56.5
6207	43.5	64.5	6207 ZZ-2RS	43.5	65.5
6208	49.0	71.5	6208 ZZ-2RS	49.0	73.5
6209	53.5	76.5	6209 ZZ-2RS	53.0	77.5
6210	59.0	81.5	6210 ZZ-2RS	59.0	83.5
6211	65.0	90.5	-	-	-
6212	71.0	100.0	6212 ZZ-2RS	71.0	101.5
6213	77.0	108.5	-	-	-
6214	81.5	114.0	6214 ZZ-2RS	81.5	115.5
6215	86.5	118.5	-	-	-
6216	94.0	129.5	-	-	-
6217	98.5	137.0	-	-	-
6218	105.5	145.5	-	-	-
6219	111.0	154.5	-	-	-
6220	117.0	162.0	-	-	-
6221	124.5	172.5	-	-	-
6222	130.0	181.0	-	-	-
6223	-	-	-	-	-
6224	140.5	195.0	-	-	-
6225	154.0	208.5	-	-	-
6226	166.0	225.0	-	-	-
6227	192.0	260.5	-	-	-

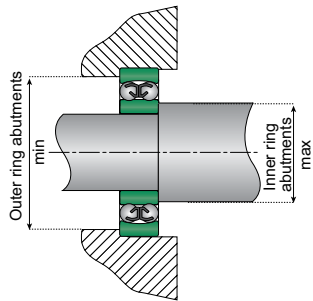
Abutments other version
Deep groove Ball Bearing

Series 600
6000-1600

General
Guidelines

Series 6300	Inner ring abutment mm	Outer ring abutment mm	Series 6300 ZZ-2RS	Inner ring abutment mm	Outer ring abutment mm
6300	16.0	29.0	6300 ZZ-2RS	16.0	30.0
6301	17.5	31.5	6301 ZZ-2RS	17.5	33.0
6302	21.0	36.5	6302 ZZ-2RS	21.0	37.5
6303	23.5	40.5	6303 ZZ-2RS	23.5	41.0
6304	27.0	45.0	6304 ZZ-2RS	27.0	45.5
6305	34.0	55.0	6305 ZZ-2RS	34.0	55.5
6306	39.0	63.0	6306 ZZ-2RS	39.0	63.5
6307	45.0	70.0	6307 ZZ-2RS	45.0	70.0
6308	50.5	79.5	6308 ZZ-2RS	50.5	79.0
6309	56.6	88.5	6309 ZZ-2RS	56.5	88.5
6310	63.0	96.5	6310 ZZ-2RS	63.0	96.5
6311	69.5	106.5	6311 ZZ-2RS	69.5	108.5
6312	75.0	115.0	-	-	-
6313	82.0	125.5	-	-	-
6314	87.0	133.5	-	-	-
6315	93.0	142.5	-	-	-
6316	99.0	152.0	-	-	-
6317	104.5	160.5	-	-	-
6318	111.5	169.0	-	-	-
6319	118.5	177.5	-	-	-
6320	127.5	188.5	-	-	-
6321	131.5	198.5	-	-	-
6322	138.5	212.0	-	-	-

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information



Open version



Series 1200	Inner ring abutment mm	Outer ring abutment mm
1200	15.0	25.5
1201	16.5	28.0
1202	19.5	31.0
1203	22.0	35.0
1204	26.0	41.0
1205	31.0	46.5
1206	37.5	55.5
1207	43.5	64.5
1208	49.0	71.5
1209	53.5	76.5
1210	59.0	81.5
1211	65.0	90.5
1212	71.0	100.0
1213	77.0	108.5
1214	81.5	114.0
1215	86.5	118.5
1216	94.0	129.5
1217	98.5	137.0
1218	105.5	145.5
1219	111.0	154.5
1220	117.0	142.0
1221	124.5	172.5
1222	130.0	181.0
1223	-	-
1224	140.5	195.0
1225	154.0	208.5
1226	166.0	225.0
1227	192.0	260.5

Series 1300	Inner ring abutment mm	Outer ring abutment mm
1300	16.0	29.0
1301	17.5	31.5
1302	21.0	36.5
1303	23.5	40.5
1304	27.0	45.0
1305	34.0	55.0
1306	39.0	63.0
1307	45.0	70.0
1308	50.5	79.5
1309	56.6	88.5
1310	63.0	96.5
1311	69.5	106.5
1312	75.0	115.0
1313	82.0	125.5
1314	87.0	133.5
1315	93.0	142.5
1316	99.0	152.0
1317	104.5	160.5
1318	111.5	169.0
1319	118.5	177.5
1320	127.5	188.5
1321	131.5	198.5
1322	138.5	212.0
1225	154.0	208.5
1226	166.0	225.0
1227	192.0	260.5

General
Guidelines

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®

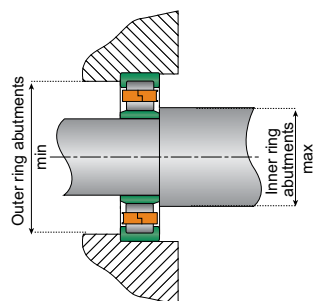


90374f

www.RollwaySmartGuide.com

Abutments

Single Row Cylindrical Roller Bearings



Open version



General Guidelines

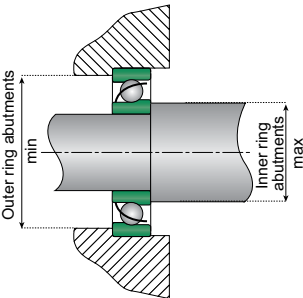
Series N 200	Series NU 200	Inner ring abutment mm	Outer ring abutment mm
N 200	NU 200	15.0	25.5
N 201	NU 201	16.5	28.0
N 202	NU 202	19.5	31.0
N 203	NU 203	22.0	35.0
N 204	NU 204	26.0	41.0
N 205	NU 205	31.0	46.5
N 206	NU 206	37.5	55.5
N 207	NU 207	43.5	64.5
N 208	NU 208	49.0	71.5
N 209	NU 209	53.5	76.5
N 210	NU 210	59.0	81.5
N 211	NU 211	65.0	90.5
N 212	NU 212	71.0	100.0
N 213	NU 213	77.0	108.5
N 214	NU 214	81.5	114.0
N 215	NU 215	86.5	118.5
N 216	NU 216	94.0	129.5
N 217	NU 217	98.5	137.0
N 218	NU 218	105.5	145.5
N 219	NU 219	111.0	154.5
N 220	NU 220	117.0	162.0
N 221	NU 221	124.5	172.5
N 222	NU 222	130.0	181.0
N 223	NU 223		
N 224	NU 224	140.5	195.0
N 225	NU 225	154.0	208.5
N 226	NU 226	166.0	225.0
N 227	NU 227	192.0	260.5

Series NJ 200	Series NUP 200	abutment mm	abutment mm
NJ 200	NUP 200	16.5	24.0
NJ 201	NUP 201	18.0	26.0
NJ 202	NUP 202	21.0	29.0
NJ 203	NUP 203	24.0	33.0
NJ 204	NUP 204	28.5	38.5
NJ 205	NUP 205	33.5	43.5
NJ 206	NUP 206	40.0	52.5
NJ 207	NUP 207	45.5	60.0
NJ 208	NUP 208	52.0	67.0
NJ 209	NUP 209	57.0	72.0
NJ 210	NUP 210	62.5	77.5
NJ 211	NUP 211	69.0	86.0
NJ 212	NUP 212	76.0	94.0
NJ 213	NUP 213	82.5	102.0
NJ 214	NUP 214	87.5	107.0
NJ 215	NUP 215	91.5	112.0
NJ 216	NUP 216	98.5	122.0
NJ 217	NUP 217	105.5	130.0
NJ 218	NUP 218	110.5	137.0
NJ 219	NUP 219	118.0	147.0
NJ 220	NUP 220	124.5	154.0
NJ 221	NUP 221	138.0	171.5

Series N 300	Series NU 300	Inner ring abutment mm	Outer ring abutment mm
N 300	NU 300	16.0	29.0
N 301	NU 301	17.5	31.5
N 302	NU 302	21.0	36.5
N 303	NU 303	23.5	40.5
N 304	NU 304	27.0	45.0
N 305	NU 305	34.0	55.0
N 306	NU 306	39.0	63.0
N 307	NU 307	45.0	70.0
N 308	NU 308	50.5	79.5
N 309	NU 309	56.6	88.5
N 310	NU 310	63.0	96.5
N 311	NU 311	69.5	106.5
N 312	NU 312	75.0	115.0
N 313	NU 313	82.0	125.5
N 314	NU 314	87.0	133.5
N 315	NU 315	93.0	142.5
N 316	NU 316	99.0	152.0
N 317	NU 317	104.5	160.5
N 318	NU 318	111.5	169.0
N 319	NU 319	118.5	177.5
N 320	NU 320	127.5	188.5
N 321	NU 321	131.5	198.5
N 322	NU 322	138.5	212.0

Series NJ 300	Series NUP 300	Inner ring abutment mm	Outer ring abutment mm
NJ 302	NUP 302	23.5	33.5
NJ 304	NUP 304	30.0	42.5
NJ 305	NUP 305	37.0	52.0
NJ 306	NUP 306	44.0	59.0
NJ 307	NUP 307	48.5	66.0
NJ 308	NUP 308	56.0	74.0
NJ 309	NUP 309	61.5	82.0
NJ 310	NUP 310	68.5	90.5
NJ 311	NUP 311	74.0	99.0
NJ 312	NUP 312	81.0	108.0
NJ 313	NUP 313	88.0	117.0
NJ 314	NUP 314	94.5	124.0
NJ 315	NUP 315	100.5	132.5
NJ 316	NUP 316	108.5	142.0
NJ 317	NUP 317	113.5	150.0
NJ 318	NUP 318	120.5	157.5
NJ 319	NUP 319	127.5	166.0
NJ 320	NUP 320	136.0	177.5
NJ 322	NUP 322	150.5	197.0

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information



Open version

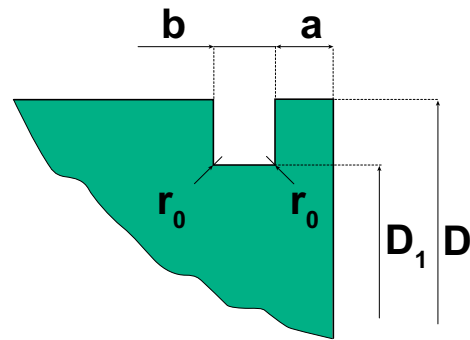


Series 7200	Inner ring abutment mm	Outer ring abutment mm
7200	16.5	24.0
7201	18.0	26.0
7202	21.0	29.0
7203	24.0	33.0
7204	28.5	38.5
7205	33.5	43.5
7206	40.0	52.5
7207	45.5	60.0
7208	52.0	67.0
7209	57.0	72.0
7210	62.5	77.5
7211	69.0	86.0
7212	76.0	94.0
7213	82.5	102.0
7214	87.5	107.0
7215	91.5	112.0
7216	98.5	122.0
7217	105.5	130.0
7218	110.5	137.0
7219	118.0	147.0
7220	124.5	154.0
7221	138.0	171.5

Series 7300	Inner ring abutment mm	Outer ring abutment mm
7302	23.5	33.5
7304	30.0	42.5
7305	37.0	52.0
7306	44.0	59.0
7307	48.5	66.0
7308	56.0	74.0
7309	61.5	82.0
7310	68.5	90.5
7311	74.0	99.0
7312	81.0	108.0
7313	88.0	117.0
7314	94.5	124.0
7315	100.5	132.5
7316	108.5	142.0
7317	113.5	150.0
7318	120.5	157.5
7319	127.5	166.0
7320	136.0	177.5
7322	150.5	197.0

General
Guidelines

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information



Dimensions
snap rings

Bearing outer diameter	Size of snap ring groove in mm								
	D1		A Series of sizes 2. 3. 4				b	r ₀	
	max.	min.	max.	min.	max.	min.	max.	min.	max.
D									
30	28.17	27.92	-	-	2.06	1.9	1.65	1.35	0.4
32	30.15	29.9	2.06	1.9	2.06	1.9	1.65	1.35	0.4
35	33.17	32.92	2.06	1.9	1.06	1.9	1.65	1.35	0.4
37	34.77	34.52	-	-	2.06	1.9	1.65	1.35	0.4
40	38.1	37.85	-	-	2.06	1.9	1.65	1.35	0.4
42	39.75	39.5	2.06	1.9	2.06	1.9	1.65	1.35	0.4
44	41.75	41.5	2.06	1.9	-	-	1.65	1.35	0.4
47	44.6	44.35	2.06	1.9	2.46	2.31	1.65	1.35	0.4
50	47.6	47.35	-	-	2.46	2.31	1.65	1.35	0.4
52	49.73	49.48	2.06	1.9	2.46	2.31	1.65	1.35	0.4
55	52.6	52.35	2.08	1.88	-	-	1.65	1.35	0.4
56	53.06	53.35	-	-	2.46	2.31	1.65	1.35	0.4
58	55.6	55.35	1.08	1.88	2.46	2.31	1.65	1.35	0.4
62	59.61	59.11	2.08	1.88	3.28	3.07	2.2	1.9	0.6
65	62.6	62.1	-	-	3.28	3.07	2.2	1.9	0.6
68	64.82	64.31	2.49	2.29	3.28	3.07	2.2	1.9	0.6
72	68.81	68.3	-	-	3.28	3.07	2.2	1.9	0.6
75	71.83	71.32	2.49	2.29	3.28	3.07	2.2	1.9	0.6
80	76.31	76.3	2.49	2.29	3.28	3.07	2.2	1.9	0.6
85	81.81	81.31	-	-	3.28	3.07	2.2	1.9	0.6
90	86.79	86.28	2.87	2.67	3.28	3.07	3	2.7	0.6
95	91.82	91.31	2.87	2.67	-	-	3	2.7	0.6
100	96.8	96.29	2.87	2.67	3.28	3.07	3	2.7	0.6
110	106.81	10.63	2.87	2.67	3.28	3.07	3	2.7	0.6
115	111.81	11.13	2.87	2.67	-	-	3	2.7	0.6
120	115.21	114.71	-	-	4.06	3.86	3.4	3.1	0.6
125	120.22	119.71	2.87	2.67	4.06	3.86	3.4	3.1	0.6
130	125.22	124.71	2.87	2.67	4.06	3.86	3.4	3.1	0.6
140	135.23	134.72	3.71	3.45	4.9	4.64	3.4	3.1	0.6
145	140.23	139.73	3.71	3.45	-	-	3.4	3.1	0.6
150	145.24	144.73	3.71	3.45	4.9	4.65	3.4	3.1	0.6
160	155.22	154.71	3.71	3.45	4.9	4.65	3.4	3.1	0.6
170	163.65	163.14	3.71	3.45	5.69	5.44	3.8	3.5	0.6
180	173.66	173.15	3.71	3.45	5.69	5.44	3.8	3.5	0.6
190	183.64	183.13	-	-	5.69	5.44	3.8	3.5	0.6
200	193.65	193.14	5.69	5.44	5.69	5.44	3.8	3.5	0.6
215	208.6	208.1	-	-	5.69	5.44	3.8	3.5	1

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

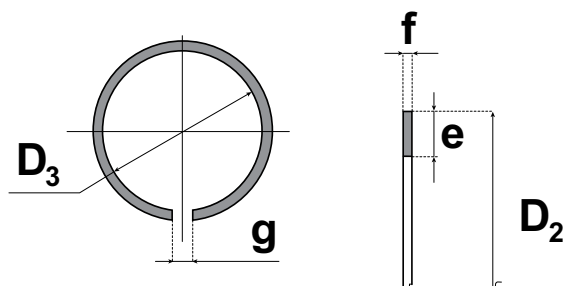
ROLLWAY®



90401a

www.RollwaySmartGuide.com

Snap rings



Dimensions
groove for
snap rings

Size of snap ring									Weight g	Snap ring number
D ₂	D ₃	ΔD _{3s}		e		f		g		
max.	nominal	upper	lower	max.	min.	max.	min			
34.7	27.9	0	-0.4	3.25	3.1	1.12	1.02	3	2.78	SP30
36.7	29.9	0	-0.4	3.25	3.1	1.12	1.02	3	2.98	SP32
39.7	32.9	0	-0.4	3.25	3.1	1.12	1.02	3	3.22	SP35
41.3	34.5	0	-0.4	3.25	3.1	1.12	1.02	3	3.36	SP37
44.6	37.8	0	-0.4	3.25	3.1	1.12	1.02	3	3.6	SP40
46.3	39.5	0	-0.5	3.25	3.1	1.12	1.02	3	3.75	SP42
48.3	41.5	0	-0.5	3.25	3.1	1.12	1.02	3	4	SP44
52.7	44.3	0	-0.5	4.04	3.89	1.12	1.02	4	5.78	SP50
57.9	49.3	0	-0.5	4.04	3.89	1.12	1.02	4	5.92	SP52
60.7	52.3	0	-0.5	4.04	3.89	1.12	1.02	4	6.17	SP55
61.7	53.2	0	-0.6	4.04	3.89	1.12	1.02	4	6.45	SP56
63.7	55.2	0	-0.6	4.04	3.89	1.12	1.02	4	6.67	SP58
67.7	59.0	0	-0.6	4.04	3.89	1.7	1.6	4	10.5	SP62
70.7	62.0	0	-0.6	4.04	3.89	1.7	1.6	4	11	SP65
74.6	64.2	0	-0.6	4.85	4.7	1.7	1.6	5	12.6	SP68
78.6	68.2	0	-0.6	4.85	4.7	1.7	1.6	5	14.7	SP72
81.6	71.2	0	-0.6	4.85	4.7	1.7	1.6	5	15.3	SP75
86.6	76.2	0	-0.6	4.85	4.7	1.7	1.6	5	16.3	SP80
91.6	81.2	0	-0.6	4.85	4.7	1.7	1.6	5	17.5	SP85
96.5	86.2	0	-0.6	4.85	4.7	2.46	2.36	5	26.6	SP90
101.6	91.2	0	-0.6	4.85	4.7	2.46	2.36	5	28.2	SP95
106.6	96.2	0	-0.8	4.85	4.7	2.46	2.36	5	29.2	SP100
116.6	106.2	0	-0.8	4.85	4.7	2.46	2.36	5	32.8	SP110
121.6	112.2	0	-0.8	4.85	4.7	2.46	2.36	5	34.4	SP115
129.7	114.6	0	-0.8	7.21	7.06	2.82	2.72	7	60.6	SP120
134.7	119.6	0	-0.8	7.21	7.06	2.82	2.72	7	63	SP125
139.7	124.6	0	-0.8	7.21	7.06	2.82	2.72	7	65.6	SP130
149.7	134.6	0	-1.2	7.21	7.06	2.82	2.72	7	70.6	SP140
154.7	139.6	0	-1.2	7.21	7.06	2.82	2.72	7	73	SP145
159.7	144.5	0	-1.2	7.21	7.06	2.82	2.72	7	77.2	SP150
169.7	154.5	0	-1.2	7.21	7.06	2.28	2.72	7	81	SP160
182.9	162.9	0	-1.2	9.6	9.45	3.1	3	10	122	SP170
192.9	172.8	0	-1.2	9.6	9.45	3.1	3	10	128	SP180
202.9	182.8	0	-1.4	9.6	9.45	3.1	3	10	139	SP190
212.9	192.8	0	-1.4	9.6	9.45	3.1	3	10	148	SP200
227.8	277.6	0	-1.4	9.6	9.45	3.1	3	10	160	SP215

Dimensions D_2 and g refer to the snap ring fitted in to the bearing groove D_3 represents the nominal inner diameter of the snap ring before mounting.

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100a

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
108	25100a	1315	25100b	3211	30100b	6034	20100m
126	25100a	1316	25100b	3212	30100b	6036	20100m
127	25100a	1317	25100b	3213	30100b	6038	20100m
129	25100a	1318	25100b	3214	30100b	6056	20100n
135	25100a	1319	25100b	3215	30100b	6060	20100n
607	20100a	1320	25100b	3216	30100b	6064	20100n
608	20100a	1322	25100b	3217	30100b	6068	20100n
609	20100a	2200	25100a	3218	30100b	6084	20100r
623	20100a	2201	25100a	3219	30100b	6088	20100r
624	20100a	2202	25100a	3220	30100b	6096	20100r
625	20100a	2203	25100a	3222	30100b	6200	20100b
626	20100a	2204	25100a	3302	30100b	6201	20100b
627	20100a	2205	25100a	3303	30100b	6202	20100b
628	20100a	2206	25100a	3304	30100b	6203	20100c
629	20100a	2207	25100a	3305	30100b	6204	20100c
634	20100a	2208	25100a	3306	30100b	6205	20100c
635	20100a	2209	25100b	3307	30100b	6206	20100d
636	20100a	2210	25100b	3308	30100b	6207	20100d
637	20100a	2211	25100b	3309	30100b	6208	20100d
638	20100a	2212	25100b	3310	30100b	6209	20100e
639	20100a	2213	25100b	3311	30100b	6210	20100e
1200	25100a	2214	25100b	3312	30100b	6211	20100e
1201	25100a	2215	25100b	3313	30100b	6212	20100f
1202	25100a	2216	25100b	3314	30100b	6213	20100f
1203	25100a	2217	25100b	3315	30100b	6214	20100f
1204	25100a	2218	25100b	3316	30100b	6215	20100h
1205	25100a	2220	25100b	3317	30100b	6216	20100h
1206	25100a	2222	25100b	3318	30100b	6217	20100h
1207	25100a	2301	25100a	3319	30100b	6218	20100h
1208	25100a	2302	25100a	3320	30100b	6219	20100k
1209	25100b	2303	25100a	3322	30100b	6220	20100k
1210	25100b	2304	25100a	6000	20100b	6221	20100k
1211	25100b	2305	25100a	6001	20100b	6222	20100k
1212	25100b	2306	25100a	6002	20100b	6224	20100k
1213	25100b	2307	25100a	6003	20100c	6226	20100m
1214	25100b	2308	25100b	6004	20100c	6228	20100m
1215	25100b	2309	25100b	6005	20100c	6230	20100m
1216	25100b	2310	25100b	6007	20100d	6232	20100m
1217	25100b	2311	25100b	6008	20100d	6234	20100m
1218	25100b	2312	25100b	6009	20100e	6236	20100m
1219	25100b	2313	25100b	6010	20100e	6238	20100m
1220	25100b	2314	25100b	6011	20100e	6244	20100n
1222	25100b	2315	25100b	6012	20100f	6248	20100n
1300	25100a	2316	25100b	6013	20100f	6256	20100n
1301	25100a	2317	25100b	6014	20100f	6260	20100n
1302	25100a	2318	25100b	6015	20100h	6264	20100n
1303	25100a	2320	25100b	6016	20100h	6268	20100n
1304	25100a	3200	30100b	6017	20100h	6300	20100b
1305	25100a	3201	30100b	6018	20100h	6301	20100b
1306	25100a	3202	30100b	6019	20100k	6302	20100b
1307	25100a	3203	30100b	6020	20100k	6303	20100c
1308	25100a	3204	30100b	6021	20100k	6304	20100c
1309	25100b	3205	30100b	6022	20100k	6305	20100c
1310	25100b	3206	30100b	6024	20100k	6306	20100d
1311	25100b	3207	30100b	6026	20100m	6307	20100d
1312	25100b	3208	30100b	6028	20100m	6308	20100d
1313	25100b	3209	30100b	6030	20100m	6309	20100e
1314	25100b	3210	30100b	6032	20100m	6310	20100e

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100b

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
6311	20100e	16032	20100m	30322	40100d	32048	40100e
6312	20100f	16034	20100m	30324	40100d	32052	40100e
6313	20100f	16038	20100m	30326	40100d	32056	40100e
6314	20100f	16044	20100n	30330	40100d	32060	40100e
6315	20100h	16056	20100n	30332	40100d	32064	40100e
6316	20100h	16064	20100n	30334	40100d	32204	40100a
6317	20100h	16068	20100n	30352	40100e	32205	40100a
6318	20100h	16072	20100n	30660	40100e	32206	40100a
6319	20100k	16076	20100r	30664	40100e	32207	40100a
6320	20100k	30202	40100a	30672	40100e	32208	40100a
6321	20100k	30203	40100a	30680	40100e	32209	40100a
6322	20100k	30204	40100a	30692	40100e	32210	40100b
6324	20100k	30205	40100a	30696	40100e	32211	40100b
6326	20100m	30206	40100a	31306	40100a	32212	40100b
6328	20100m	30207	40100a	31307	40100a	32213	40100b
6330	20100m	30208	40100a	31308	40100a	32214	40100b
6344	20100n	30209	40100a	31309	40100a	32215	40100c
6356	20100n	30210	40100b	31310	40100b	32216	40100c
6405	20100c	30211	40100b	31311	40100b	32217	40100c
6406	20100d	30212	40100b	31312	40100b	32218	40100c
6407	20100d	30213	40100b	31313	40100b	32219	40100c
6408	20100d	30214	40100b	31315	40100c	32220	40100c
6409	20100e	30215	40100c	31316	40100c	32221	40100d
6410	20100e	30216	40100c	31317	40100c	32222	40100d
6411	20100e	30217	40100c	31318	40100c	32224	40100d
6412	20100f	30219	40100c	31319	40100c	32226	40100d
6413	20100f	30220	40100c	31320	40100c	32228	40100d
6414	20100f	30221	40100d	31322	40100d	32230	40100d
6415	20100h	30222	40100d	31324	40100d	32232	40100d
6416	20100h	30224	40100d	31326	40100d	32234	40100d
6417	20100h	30226	40100d	32004	40100a	32238	40100e
6418	20100h	30230	40100d	32005	40100a	32240	40100e
16001	20100b	30232	40100d	32006	40100a	32244	40100e
16002	20100b	30234	40100d	32007	40100a	32248	40100e
16003	20100c	30236	40100e	32008	40100a	32252	40100e
16004	20100c	30238	40100e	32009	40100a	32304	40100a
16005	20100c	30240	40100e	32010	40100b	32305	40100a
16006	20100d	30244	40100e	32011	40100b	32306	40100a
16007	20100d	30302	40100a	32012	40100b	32307	40100a
16008	20100d	30303	40100a	32013	40100b	32308	40100a
16009	20100e	30304	40100a	32014	40100b	32309	40100a
16010	20100e	30305	40100a	32015	40100c	32310	40100b
16011	20100e	30306	40100a	32016	40100c	32311	40100b
16012	20100f	30307	40100a	32017	40100c	32312	40100b
16013	20100f	30308	40100a	32018	40100c	32313	40100b
16014	20100f	30309	40100a	32019	40100c	32314	40100b
16015	20100h	30310	40100b	32020	40100c	32315	40100c
16016	20100h	30311	40100b	32021	40100d	32316	40100c
16017	20100h	30312	40100b	32022	40100d	32317	40100c
16018	20100h	30313	40100b	32024	40100d	32319	40100c
16019	20100k	30314	40100b	32028	40100d	32320	40100c
16020	20100k	30315	40100c	32030	40100d	32321	40100d
16021	20100k	30316	40100c	32032	40100d	32322	40100d
16022	20100k	30317	40100c	32034	40100d	32324	40100d
16024	20100k	30318	40100c	32036	40100e	32326	40100d
16026	20100m	30319	40100c	32038	40100e	32330	40100d
16028	20100m	30320	40100c	32040	40100e	32938	40100e
16030	20100m	30321	40100d	32044	40100e	32940	40100e

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100c

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
32944	40100e	51112	50100a	52217	50100c	61822	20100k
32948	40100e	51113	50100a	52218	50100c	61824	20100k
32952	40100e	51114	50100a	52220	50100c	61826	20100m
32956	40100e	51115	50100a	52222	50100c	61830	20100m
32960	40100e	51116	50100a	52224	50100c	61832	20100m
32964	40100e	51117	50100a	52226	50100c	61836	20100m
32968	40100e	51118	50100b	52305	50100c	61838	20100m
32972	40100e	51120	50100b	52306	50100c	61880	20100r
33005	40100a	51122	50100b	52307	50100c	61884	20100r
33009	40100a	51201	50100a	52308	50100c	61896	20100r
33010	40100b	51202	50100a	52309	50100c	61900	20100b
33013	40100b	51203	50100a	52310	50100c	61901	20100b
33014	40100b	51204	50100a	52311	50100c	61902	20100b
33015	40100c	51205	50100a	52312	50100c	61903	20100c
33016	40100c	51206	50100a	52313	50100c	61904	20100c
33017	40100c	51207	50100a	52314	50100c	61905	20100c
33018	40100c	51208	50100a	52315	50100c	61906	20100d
33019	40100c	51209	50100a	52316	50100c	61907	20100d
33020	40100c	51210	50100a	52317	50100c	61908	20100d
33021	40100d	51211	50100a	52318	50100c	61909	20100e
33022	40100d	51212	50100a	52320	50100c	61910	20100e
33024	40100d	51213	50100a	52322	50100c	61916	20100h
33030	40100d	51214	50100a	52324	50100c	61922	20100k
33109	40100a	51215	50100a	52405	50100c	61924	20100k
33110	40100b	51216	50100a	52406	50100c	61936	20100m
33111	40100b	51217	50100a	52407	50100c	61960	20100n
33112	40100b	51218	50100b	52408	50100c	61964	20100n
33113	40100b	51220	50100b	52409	50100c	61976	20100r
33114	40100b	51222	50100b	52410	50100c	61980	20100r
33115	40100c	51305	50100a	52411	50100c	61992	20100r
33116	40100c	51306	50100a	52412	50100c	16036 M	20100m
33117	40100c	51307	50100a	52413	50100c	16040 M	20100n
33118	40100c	51308	50100a	52420	50100c	16048 M	20100n
33120	40100c	51309	50100a	60872	20100n	16052 M	20100n
33121	40100d	51310	50100a	60880	20100r	21307 GMEX	45100a
33122	40100d	51311	50100a	60888	20100r	21308 C	45100a
33124	40100d	51312	50100a	60964	20100n	21308 GMEX	45100a
33205	40100a	51313	50100a	60980	20100r	21309 C	45100a
33207	40100a	51314	50100a	60988	20100r	21309 GMEX	45100a
33209	40100a	51315	50100a	61800	20100b	21310 C	45100a
33210	40100b	51316	50100a	61801	20100b	21310 GMEX	45100a
33212	40100b	51317	50100a	61802	20100b	21311 C	45100a
33213	40100b	51318	50100b	61803	20100c	21311 GMEX	45100a
33214	40100b	51320	50100b	61804	20100c	21311 MA C4 F80	45100a
33215	40100c	52202	50100c	61805	20100c	21312 C	45100b
33216	40100c	52204	50100c	61806	20100d	21312 CA	45100b
51100	50100a	52205	50100c	61807	20100d	21312 GMEX	45100b
51101	50100a	52206	50100c	61808	20100d	21313 C	45100b
51102	50100a	52207	50100c	61809	20100e	21313 CA	45100b
51103	50100a	52208	50100c	61810	20100e	21313 GMEX	45100b
51104	50100a	52209	50100c	61811	20100e	21314 C	45100b
51105	50100a	52210	50100c	61812	20100f	21314 CA	45100b
51106	50100a	52211	50100c	61813	20100f	21314 GMEX	45100b
51107	50100a	52212	50100c	61814	20100f	21315 C	45100b
51108	50100a	52213	50100c	61816	20100h	21315 CA	45100b
51109	50100a	52214	50100c	61817	20100h	21315 GMEX	45100b
51110	50100a	52215	50100c	61818	20100h	21316 C	45100c
51111	50100a	52216	50100c	61820	20100k	21316 CA	45100c

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100d

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
21316 GMEX	45100c	22217 C	45100c	22248 GMEX	45100x	22315 C 2RS	45100b
21317 C	45100c	22217 CA	45100c	22248 MB	45100x	22315 CA	45100b
21317 CA	45100c	22217 GMEX	45100c	22252 CA	45100x	22315 GMEX	45100b
21317 GMEX	45100c	22217 MB	45100c	22252 MB	45100x	22315 MA C4 F80	45100b
21318 C	45100c	22218 C	45100c	22256 C	45100z	22315 MB	45100b
21318 GMEX	45100c	22218 CA	45100c	22256 CA	45100z	22315 VS C4 F80	45100b
21319 CA	45100d	22218 GMEX	45100c	22256 MB	45100z	22316 C	45100c
21319 GMEX	45100d	22218 MB	45100c	22260 CA	45100z	22316 C 2RS	45100c
21319 MB	45100d	22219 C	45100d	22260 MB	45100z	22316 CA	45100c
21320 CA	45100d	22219 CA	45100d	22264 CA	45101a	22316 GMEX	45100c
21320 GMEX	45100d	22219 GMEX	45100d	22264 MB	45101a	22316 MA C4 F80	45100c
21320 MB	45100d	22219 MB	45100d	22272 CA	45101a	22316 MB	45100c
21322 MB	45100e	22220 C	45100d	22308 C	45100a	22316 VS C4 F80	45100c
2205 2RS	25100a	22220 CA	45100d	22308 C 2RS	45100a	22317 C	45100c
2206 2RS	25100a	22220 GMEX	45100d	22308 CA	45100a	22317 C 2RS	45100c
2207 2RS	25100a	22220 MB	45100d	22308 GMEX	45100a	22317 CA	45100c
2208 2RS	25100a	22222 C	45100e	22308 MB	45100a	22317 GMEX	45100c
2209 2RS	25100b	22222 CA	45100e	22308 VS C4 F80	45100a	22317 MA C4 F80	45100c
2210 2RS	25100b	22222 GMEX	45100e	22309 C	45100a	22317 MB	45100c
22205 C	45100a	22222 MB	45100e	22309 C 2RS	45100a	22317 VS C4 F80	45100c
22205 CA	45100a	22224 C	45100f	22309 CA	45100a	22318 C	45100c
22205 GMEX	45100a	22224 CA	45100f	22309 GMEX	45100a	22318 C 2RS	45100c
22206 C	45100a	22224 GMEX	45100f	22309 MB	45100a	22318 CA	45100c
22206 GMEX	45100a	22224 MB	45100f	22309 VS C4 F80	45100a	22318 GMEX	45100c
22207 C	45100a	22226 C	45100h	22310 C	45100a	22318 MA C4 F80	45100c
22207 CA	45100a	22226 CA	45100h	22310 C 2RS	45100a	22318 MB	45100c
22207 GMEX	45100a	22226 GMEX	45100h	22310 CA	45100a	22318 VS C4 F80	45100c
22208 C	45100a	22226 MB	45100h	22310 GMEX	45100a	22319 C	45100d
22208 CA	45100a	22228 C	45100m	22310 MA C4 F80	45100a	22319 C 2RS	45100d
22208 GMEX	45100a	22228 CA	45100m	22310 MB	45100a	22319 CA	45100d
22209 C	45100a	22228 GMEX	45100m	22310 VS C4 F80	45100a	22319 GMEX	45100d
22209 CA	45100a	22228 MB	45100m	22311 C	45100a	22319 MA C4 F80	45100d
22209 GMEX	45100a	22230 C	45100n	22311 C 2RS	45100a	22319 MB	45100d
22210 C	45100a	22230 CA	45100n	22311 CA	45100a	22319 VS C4 F80	45100d
22210 CA	45100a	22230 GMEX	45100n	22311 GMEX	45100a	22320 C	45100d
22210 GMEX	45100a	22230 MB	45100n	22311 MA C4 F80	45100a	22320 C 2RS	45100d
22211 C	45100a	22232 C	45100r	22311 VS C4 F80	45100a	22320 CA	45100d
22211 CA	45100a	22232 CA	45100r	22312 C	45100b	22320 GMEX	45100d
22211 GMEX	45100a	22232 GMEX	45100r	22312 C 2RS	45100b	22320 MA C4 F80	45100d
22212 C	45100b	22232 MB	45100r	22312 CA	45100b	22320 MB	45100d
22212 CA	45100b	22233 CA	45100r	22312 GMEX	45100b	22320 VS C4 F80	45100d
22212 GMEX	45100b	22234 C	45100s	22312 MA C4 F80	45100b	22322 C	45100e
22212 MB	45100b	22234 CA	45100s	22312 MB	45100b	22322 C 2RS	45100e
22213 C	45100b	22234 GMEX	45100s	22312 VS C4 F80	45100b	22322 CA	45100e
22213 CA	45100b	22234 MB	45100s	22313 C	45100b	22322 GMEX	45100e
22213 GMEX	45100b	22236 C	45100t	22313 C 2RS	45100b	22322 MA C4 F80	45100e
22213 MB	45100b	22236 CA	45100t	22313 CA	45100b	22322 MB	45100e
22214 C	45100b	22236 GMEX	45100t	22313 GMEX	45100b	22322 VS C4 F80	45100e
22214 CA	45100b	22236 MB	45100t	22313 MA C4 F80	45100b	22324 C	45100f
22214 GMEX	45100b	22238 CA	45100u	22313 MB	45100b	22324 C 2RS	45100s
22215 C	45100b	22238 GMEX	45100u	22313 VS C4 F80	45100b	22324 CA	45100f
22215 CA	45100b	22238 MB	45100u	22314 C	45100b	22324 GMEX	45100f
22215 GMEX	45100b	22240 CA	45100v	22314 C 2RS	45100b	22324 MA C4 F80	45100f
22215 MB	45100b	22240 GMEX	45100v	22314 CA	45100b	22324 MB	45100f
22216 C	45100c	22244 CA	45100w	22314 GMEX	45100b	22324 VS C4 F80	45100f
22216 CA	45100c	22244 GMEX	45100w	22314 MB	45100b	22326 C	45100h
22216 GMEX	45100c	22244 MB	45100w	22314 VS C4 F80	45100b	22326 C 2RS	45100h
22216 MB	45100c	22248 CA	45100x	22315 C	45100b	22326 CA	45100h

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100e

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
22326 GMEX	45100h	230/1180 CA	45101f	23044 MB	45100w	23124 CA	45100f
22326 MA C4 F80	45100h	230/1250 CA	45101f	23048 CA	45100x	23124 GMEX	45100f
22326 MB	45100h	230/500 CA	45101c	23048 GMEX	45100x	23124 MB	45100f
22326 VS C4 F80	45100h	230/500 MB	45101c	23048 MB	45100x	23126 C	45100h
22328 C	45100m	230/530 CA	45101d	2305 2RS	25100a	23126 CA	45100h
22328 C 2RS	45100m	230/560 CA	45101d	23052 C	45100x	23126 GMEX	45100h
22328 CA	45100m	230/600 CA	45101d	23052 CA	45100x	23126 MB	45100h
22328 GMEX	45100m	230/600 MB	45101d	23052 GMEX	45100x	23128 C	45100m
22328 MA C4 F80	45100m	230/630 CA	45101d	23052 MB	45100x	23128 CA	45100m
22328 MB	45100m	230/670 CA	45101d	23056 C	45100z	23128 GMEX	45100m
22328 VS C4 F80	45100m	230/710 CA	45101e	23056 CA	45100z	23128 MB	45100m
22330 C	45100n	230/750 CA	45101e	23056 GMEX	45100z	23130 CA	45100n
22330 C 2RS	45100n	230/800 CA	45101e	23056 MB	45100z	23130 GMEX	45100n
22330 CA	45100n	230/800 MB	45101e	2306 2RS	25100a	23130 MB	45100n
22330 GMEX	45100n	230/850 CA	45101e	23060 CA	45100z	23132 C	45100r
22330 MA C4 F80	45100n	230/900 CA	45101e	23060 MB	45100z	23132 CA	45100r
22330 MB	45100n	230/950 CA	45101e	23064 CA	45101a	23132 GMEX	45100r
22330 VS C4 F80	45100n	23020 CA	45100d	23064 MB	45101a	23132 MB	45100r
22332 C	45100r	23020 GMEX	45100d	23068 CA	45101a	23134 C	45100s
22332 CA	45100r	23022 CA	45100e	23068 MB	45101a	23134 CA	45100s
22332 GMEX	45100r	23022 GMEX	45100e	2307 2RS	25100a	23134 GMEX	45100s
22332 MA C4 F80	45100r	23022 MB	45100e	23072 CA	45101a	23134 MB	45100s
22332 MB	45100r	23024 C	45100e	23072 MB	45101a	23136 C	45100t
22332 VS C4 F80	45100r	23024 CA	45100f	23076 CA	45101b	23136 CA	45100t
22334 C	45100s	23024 GMEX	45100f	23076 MB	45101b	23136 GMEX	45100t
22334 CA	45100s	23024 MB	45100e	2308 2RS	25100a	23136 MB	45100t
22334 GMEX	45100s	23026 C	45100h	23080 CA	45101b	23138 C	45100u
22334 MA C4 F80	45100s	23026 CA	45100h	23080 MB	45100m	23138 CA	45100u
22334 MB	45100s	23026 GMEX	45100h	23080 MB	45101b	23138 GMEX	45100u
22334 VS C4 F80	45100s	23026 MB	45100h	23084 CA	45101b	23138 MB	45100u
22336 CA	45100t	23028 C	45100m	23084 MB	45101b	23140 CA	45100v
22336 GMEX	45100t	23028 CA	45100m	23088 CA	45101c	23140 GMEX	45100v
22336 MA C4 F80	45100t	23028 GMEX	45100m	2309 2RS	25100b	23144 CA	45100w
22336 MB	45100t	23030 C	45100n	23092 CA	45101c	23144 GMEX	45100w
22336 VS C4 F80	45100t	23030 CA	45100n	23092 MB	45101c	23144 MB	45100w
22338 CA	45100u	23030 GMEX	45100n	23096 CA	45101c	23148 CA	45100x
22338 GMEX	45100u	23030 MB	45100n	231/1000 CA	45101f	23148 GMEX	45100x
22338 MA C4 F80	45100u	23032 C	45100r	231/500 CA	45101c	23148 MB	45100x
22338 MB	45100u	23032 CA	45100r	231/530 CA	45101d	23152 CA	45100x
22340 CA	45100v	23032 GMEX	45100r	231/560 CA	45101d	23152 MB	45100x
22340 GMEX	45100v	23032 MB	45100r	231/600 CA	45101d	23156 CA	45100z
22340 MA C4 F80	45100v	23034 C	45100s	231/630 CA	45101d	23156 MB	45100z
22340 MB	45100v	23034 CA	45100s	231/670 CA	45101d	23160 CA	45100z
22344 C	45100w	23034 GMEX	45100s	231/710 CA	45101e	23160 MB	45100z
22344 CA	45100w	23034 MB	45100s	231/750 CA	45101e	23164 CA	45101a
22344 GMEX	45100w	23036 C	45100t	231/800 CA	45101e	23164 MB	45101a
22348 CA	45100x	23036 CA	45100t	231/850 CA	45101e	23168 CA	45101a
22348 MB	45100x	23036 GMEX	45100t	2310 2RS	25100b	23168 MB	45101a
22352 C	45100x	23036 MB	45100t	23111 MB	45100a	23172 CA	45101a
22352 CA	45100x	23038 C	45100u	23120 CA	45100d	23176 CA	45101b
22356 CA	45100z	23038 CA	45100u	23120 GMEX	45100d	23176 MB	45101b
22364 CA	45101a	23038 GMEX	45100u	23120 MB	45100d	23180 CA	45101b
22372 CA	45101a	23038 MB	45100u	23121 CA	45100d	23180 MB	45101b
22380 CA	45101b	23040 CA	45100v	23121 GMEX	45100d	23184 CA	45101b
22380 MB	45101b	23040 GMEX	45100v	23122 C	45100e	23188 CA	45101c
230/1000 CA	45101f	23044 C	45100w	23122 CA	45100e	23192 CA	45101c
230/1060 CA	45101f	23044 CA	45100w	23122 GMEX	45100e	23196 CA	45101c
230/1120 CA	45101f	23044 GMEX	45100w	23122 MB	45100e	232/500 CA	45101c

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100f

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
232/530 CA	45101d	23256 MB	45100z	23944 CA	45100w	24034 CA	45100s
232/560 CA	45101d	23260 CA	45100z	23944 MB	45100w	24034 GMEX	45100s
232/600 CA	45101d	23260 MB	45100z	23948 CA	45100x	24034 MB	45100s
232/670 CA	45101d	23264 CA	45101a	23948 MB	45100x	24036 CA	45100t
232/710 CA	45101e	23264 MB	45101a	23952 CA	45100x	24036 GMEX	45100t
232/750 CA	45101e	23268 CA	45101a	23952 MB	45100x	24036 MB	45100t
23218 CA	45100c	23272 CA	45101a	23956 C	45100z	24038 CA	45100u
23218 GMEX	45100c	23276 CA	45101b	23956 CA	45100z	24038 GMEX	45100u
23218 MB	45100c	23276 MB	45101b	23960 CA	45100z	24038 MB	45100u
23220 C	45100d	23280 CA	45101b	23960 MB	45100z	24040 CA	45100v
23220 CA	45100d	23284 CA	45101b	23964 CA	45101a	24040 GMEX	45100v
23220 GMEX	45100d	23284 MB	45101b	23964 MB	45101a	24044 CA	45100w
23220 MB	45100d	23288 CA	45101c	23968 CA	45101a	24044 GMEX	45100w
23222 C	45100e	23289 CA	45101c	23968 MB	45101a	24044 MB	45100w
23222 CA	45100e	23292 CA	45101c	23972 CA	45101a	24048 CA	45100x
23222 GMEX	45100e	23296 CA	45101c	23972 MB	45101a	24048 GMEX	45100x
23222 MB	45100e	23328 CA	45100m	23976 CA	45101b	24052 CA	45100x
23224 C	45100f	23328 MA C4 F80	45100m	23980 CA	45101b	24052 GMEX	45100x
23224 CA	45100f	23332 MA C4 F80	45100r	23984 CA	45101b	24052 MB	45100x
23224 GMEX	45100f	23332 VS C4 F80	45100r	23988 CA	45101c	24056 CA	45100z
23224 MB	45100f	23340 CA	45100v	23992 CA	45101c	24056 MB	45100z
23226 C	45100h	23772 MB	45101a	23996 CA	45101c	24060 CA	45100z
23226 CA	45100h	238/1000 CA	45101f	23996 MB	45101c	24064 CA	45101a
23226 GMEX	45100h	238/1060 CA	45101f	240/1000 CA	45101f	24068 CA	45101a
23226 MB	45100h	238/1180 CA	45101f	240/1060 CA	45101f	24072 CA	45101a
23228 CA	45100m	238/500 CA	45101c	240/1120 CA	45101f	24076 CA	45101b
23228 GMEX	45100m	238/530 CA	45101d	240/1320 CA	45101f	24080 CA	45101b
23228 MB	45100m	238/630 CA	45101d	240/500 CA	45101c	24080 MB	45100m
23230 CA	45100n	238/670 CA	45101d	240/530 CA	45101d	24084 CA	45101b
23230 GMEX	45100n	238/710 CA	45101e	240/560 CA	45101d	24088 CA	45101c
23230 MB	45100n	238/750 CA	45101e	240/600 CA	45101d	24088 MB	45101c
23232 CA	45100r	238/850 CA	45101e	240/670 CA	45101d	24092 CA	45101c
23232 GMEX	45100r	23856 CA	45100z	240/710 CA	45101e	24096 CA	45101c
23232 MB	45100r	23860 CA	45100z	240/750 CA	45101e	241/1000 CA	45101f
23234 C	45100s	23864 CA	45101a	240/800 CA	45101e	241/500 CA	45101c
23234 CA	45100s	23884 CA	45101b	240/850 CA	45101e	241/530 CA	45101d
23234 GMEX	45100s	23896 CA	45101c	240/900 CA	45101e	241/560 CA	45101d
23234 MB	45100s	239/1060 CA	45101f	240/950 CA	45101e	241/600 CA	45101d
23236 CA	45100t	239/1180 CA	45101f	240/950 CAF	45101e	241/630 CA	45101d
23236 GMEX	45100t	239/500 CA	45101c	24018 CA	45100c	241/670 CA	45101d
23236 MB	45100t	239/530 CA	45101d	24020 CA	45100d	241/710 CA	45101e
23238 C	45100u	239/560 CA	45101d	24020 GMEX	45100d	241/750 CA	45101e
23238 CA	45100u	239/600 CA	45101d	24022 CA	45100e	241/800 CA	45101e
23238 GMEX	45100u	239/630 CA	45101d	24022 GMEX	45100e	241/850 CA	45101e
23238 MB	45100u	239/670 CA	45101d	24024 CA	45100f	241/900 CA	45101e
23240 CA	45100v	239/710 CA	45101e	24024 GMEX	45100f	241/950 CA	45101e
23240 GMEX	45100v	239/750 CA	45101e	24024 MB	45100f	24122 CA	45100e
23240 MB	45100v	239/800 CA	45101e	24026 CA	45100h	24122 GMEX	45100e
23244 C	45100w	239/800 MB	45101e	24026 GMEX	45100h	24124 CA	45100f
23244 CA	45100w	239/850 CA	45101e	24026 MB	45100h	24124 GMEX	45100f
23244 GMEX	45100w	239/900 CA	45101e	24028 CA	45100m	24124 MB	45100f
23244 MB	45100w	239/950 CA	45101e	24028 GMEX	45100m	24126 CA	45100h
23248 CA	45100x	239/950 CAF	45101e	24030 CA	45100n	24126 GMEX	45100h
23248 GMEX	45100x	23936 CA	45100t	24030 GMEX	45100n	24126 MB	45100h
23248 MB	45100x	23938 CA	45100u	24030 MB	45100n	24128 CA	45100m
23252 CA	45100x	23940 CA	45100v	24032 CA	45100r	24128 GMEX	45100m
23252 MB	45100x	23940 MB	45100v	24032 GMEX	45100r	24128 MB	45100m
23256 CA	45100z	23944 C	45100w	24032 MB	45100r	24130 C	45100n

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100h

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
24130 CA	45100n	249/750 CA	45101e	29348 EM	55100a	306/680	40100e
24130 GMEX	45100n	249/800 CA	45101e	29352 EM	55100a	31305 A	40100a
24132 C	45100r	249/850 CA	45101e	29356 EM	55100a	319/710	40100e
24132 CA	45100r	249/950 CA	45101e	29360 EM	55100a	32026 X	40100d
24132 GMEX	45100r	2650C CA	45100x	29364 EM	55100a	3203 2RS	30100b
24134 C	45100s	292/500 EM	55100b	29368 EM	55100b	32236 A	40100e
24134 CA	45100s	292/530 EM	55100b	29372 EM	55100b	32318 A	40100c
24134 GMEX	45100s	292/560 EM	55100b	29376 EM	55100b	32328 A	40100d
24136 C	45100t	292/600 EM	55100b	29380 EM	55100b	32332 A	40100d
24136 CA	45100t	292/630 EM	55100b	29384 EM	55100b	329/630	40100e
24136 GMEX	45100t	292/670 EM	55100b	29388 EM	55100b	3308 2RS	30100b
24138 CA	45100u	292/710 EM	55100b	29392 EM	55100b	51126 M	50100b
24138 GMEX	45100u	292/750 EM	55100b	29396 EM	55100b	51128 M	50100b
24138 MB	45100u	292/800 EM	55100b	294/500 EM	55100b	51130 M	50100b
24140 CA	45100v	292/850 EM	55100b	294/530 EM	55100b	51132 M	50100b
24140 GMEX	45100v	292/900 EM	55100b	294/560 EM	55100b	51134 M	50100b
24140 MB	45100v	292/950 EM	55100b	294/600 EM	55100b	51136 M	50100b
24144 CA	45100w	29234 EM	55100a	294/630 EM	55100b	51138 M	50100b
24144 MB	45100w	29236 EM	55100a	294/710 EM	55100b	51140 M	50100b
24148 CA	45100x	29238 EM	55100a	294/750 EM	55100b	51144 M	50100b
24148 GMEX	45100x	29240 EM	55100a	294/850 EM	55100b	51148 M	50100b
24148 MB	45100x	29244 EM	55100a	29412 EM	55100a	51152 M	50100b
24152 CA	45100x	29248 EM	55100a	29413 EM	55100a	51156 M	50100b
24156 CA	45100z	29252 EM	55100a	29414 EM	55100a	51160 M	50100b
24156 MB	45100z	29256 EM	55100a	29415 EM	55100a	51164 M	50100b
24160 CA	45100z	29260 EM	55100a	29416 EM	55100a	51224M	50100b
24164 CA	45101a	29264 EM	55100a	29417 EM	55100a	51226 M	50100b
24166 CA	45101a	29268 EM	55100b	29418 EM	55100a	51228 M	50100b
24168 CA	45101a	29272 EM	55100b	29420 EM	55100a	51230 M	50100b
24168 MB	45101a	29276 EM	55100b	29422 EM	55100a	51232 M	50100b
24172 CA	45101a	29280 EM	55100b	29424 EM	55100a	51234 M	50100b
24176 CA	45101b	29284 EM	55100b	29426 EM	55100a	51236 M	50100b
24180 CA	45101b	29288 EM	55100b	29428 EM	55100a	51238 M	50100b
24184 CA	45101b	29292 EM	55100b	29430 EM	55100a	51240 M	50100b
24188 CA	45101c	29296 EM	55100b	29432 EM	55100a	51244 M	50100b
24192 CA	45101c	293/500 EM	55100b	29434 EM	55100a	51248 M	50100b
24196 CA	45101c	293/530 EM	55100b	29436 EM	55100a	51252 M	50100b
24218 CA	45100c	293/560 EM	55100b	29438 EM	55100a	51256 M	50100b
24712 CA	45101a	293/600 EM	55100b	29440 EM	55100a	51260 M	50100b
248/1060 CA	45101f	293/630 EM	55100b	29444 EM	55100a	51324 M	50100b
248/1120 CA	45101f	293/670 EM	55100b	29448 EM	55100a	51330 M	50100b
248/1180 CA	45101f	293/710 EM	55100b	29452 EM	55100a	51334 M	50100b
248/1320 CA	45101f	293/750 EM	55100b	29456 EM	55100a	51336 M	50100b
248/1500 CA	45101f	293/800 EM	55100b	29460 EM	55100a	51338 M	50100b
248/1800 CA	45101f	29317 EM	55100a	29464 EM	55100a	51430 M	50100b
248/530 CA	45101d	29318 EM	55100a	29468 EM	55100b	52228M	50100c
248/670 CA	45101d	29320 EM	55100a	29472 EM	55100b	52230M	50100c
248/800 CA	45101e	29322 EM	55100a	29476 EM	55100b	52232M	50100c
248/900 CA	45101e	29324 EM	55100a	29480 EM	55100b	52234M	50100c
24892 CA	45101c	29326 EM	55100a	29484 EM	55100b	52330M	50100c
249/1000 CA	45101f	29328 EM	55100a	29488 EM	55100b	60/1000	20100s
249/1060 CA	45101f	29330 EM	55100a	29492 EM	55100b	60/1060	20100s
249/1120 CA	45101f	29332 EM	55100a	29496 EM	55100b	60/1120	20100s
249/1180 CA	45101f	29334 EM	55100a	30228 A	40100d	60/500	20100r
249/1320 CA	45101f	29336 EM	55100a	30328 A	40100d	60/530	20100r
249/1400 CA	45101f	29338 EM	55100a	306/1000	40100e	60/630	20100r
249/600 CA	45101d	29340 EM	55100a	306/560	40100e	60/710	20100r
249/710 CA	45101e	29344 EM	55100a	306/630	40100e	60/750	20100r

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100k

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
60/800	20100r	6052 M	20100n	619/1060	20100s	6211 ZZ	20100e
60/850	20100r	607 2RS	20100a	619/1120	20100s	6212 2RS	20100f
60/900	20100s	607 ZZ	20100a	619/1180	20100s	6212 ZZ	20100f
60/950	20100s	6072 M	20100n	619/1400	20100s	6213 2RS	20100f
6000 2RS	20100b	608 2RS	20100a	619/1500	20100s	6213 ZZ	20100f
6000 ZZ	20100b	608 ZZ	20100a	619/1600	20100s	6214 2RS	20100f
6001 2RS	20100b	608/1000 M	20100s	619/500	20100r	6214 ZZ	20100f
6001 ZZ	20100b	608/500	20100r	619/630	20100r	6215 2RS	20100h
6002 2RS	20100b	608/560	20100r	619/670 M	20100r	6215 ZZ	20100h
6002 ZZ	20100b	608/600	20100r	619/710	20100r	6216 2RS	20100h
6003 2RS	20100c	608/630	20100r	619/750	20100r	6216 ZZ	20100h
6003 ZZ	20100c	608/800	20100r	619/800	20100r	6217 2RS	20100h
6004 2RS	20100c	608/850	20100r	619/850	20100r	6217 ZZ	20100h
6004 ZZ	20100c	6080 M	20100r	619/900	20100s	6218 2RS	20100h
6005 2RS	20100c	609 2RS	20100a	619/950	20100s	6218 ZZ	20100h
6005 ZZ	20100c	609 ZZ	20100a	61900 ZZ	20100b	6219 ZZ	20100k
6006 2RS	20100d	609/1000	20100s	61901 ZZ	20100b	6220 2RS	20100k
6006 ZZ	20100d	609/1320	20100s	61902 ZZ	20100b	6220 ZZ	20100k
6007 2RS	20100d	609/530	20100r	61903 ZZ	20100c	62206 2RS	20100d
6008 2RS	20100d	609/630	20100r	61904 ZZ	20100c	6222 ZZ	20100k
6008 ZZ	20100d	609/670	20100r	61905 ZZ	20100c	6224 ZZ	20100k
6009 2RS	20100e	609/710	20100r	61914 2RS	20100f	6228 M	20100m
6009 ZZ	20100e	618/1000 M	20100s	61926 M	20100m	623 ZZ	20100a
6010 2RS	20100e	618/1060	20100s	61930 M	20100m	62332M	50100c
6010 ZZ	20100e	618/1120	20100s	61932 M	20100m	6234 M	20100m
6011 2RS	20100e	618/1250	20100s	61934 M	20100m	624 ZZ	20100a
6011 ZZ	20100e	618/1400	20100s	61940 M	20100n	6240 M	20100n
6012 2RS	20100f	618/1500	20100s	61944 M	20100n	625 ZZ	20100a
6012 ZZ	20100f	618/1600	20100s	61948 M	20100n	626 2RS	20100a
6013 2RS	20100f	618/1700	20100s	61952 M	20100n	626 ZZ	20100a
6013 ZZ	20100f	618/500 M	20100r	61956 M	20100n	628 2RS	20100a
6014 2RS	20100f	618/560 M	20100r	61968 M	20100n	628 ZZ	20100a
6014 ZZ	20100f	618/600	20100r	61972 M	20100n	628/6 ZZ	20100a
6015 2RS	20100h	618/670	20100r	61984 M	20100r	628/7 ZZ	20100a
6015 ZZ	20100h	618/710	20100r	61988 M	20100r	629 2RS	20100a
6016 2RS	20100h	618/750	20100r	6200 2RS	20100b	629 ZZ	20100a
6016 ZZ	20100h	618/800	20100r	6200 ZZ	20100b	6300 2RS	20100b
6017 2RS	20100h	618/850	20100r	6201 2RS	20100b	6300 ZZ	20100b
6017 ZZ	20100h	618/900 CA	20100s	6201 ZZ	20100b	6301 2RS	20100b
6018 2RS	20100h	61800 ZZ	20100b	6202 2RS	20100b	6301 ZZ	20100b
6018 ZZ	20100h	61801 ZZ	20100b	6202 ZZ	20100b	6302 2RS	20100b
6019 2RS	20100k	61802 ZZ	20100b	6203 2RS	20100c	6302 ZZ	20100b
6019 ZZ	20100k	61803 ZZ	20100c	6203 ZZ	20100c	6303 2RS	20100c
6020 2RS	20100k	61804 ZZ	20100c	6204 2RS	20100c	6303 ZZ	20100c
6020 ZZ	20100k	61805 ZZ	20100c	6204 ZZ	20100c	6304 2RS	20100c
6021 ZZ	20100k	61840 M	20100n	6205 2RS	20100c	6304 ZZ	20100c
6022 ZZ	20100k	61844 M	20100n	6205 ZZ	20100c	6305 2RS	20100c
6024 2RS	20100k	61848 M	20100n	6206 2RS	20100d	6305 ZZ	20100c
6024 ZZ	20100k	61852 M	20100n	6206 ZZ	20100d	6306 2RS	20100d
6026 ZZ	20100m	61856 M	20100n	6207 2RS	20100d	6306 ZZ	20100d
6028 ZZ	20100m	61860 M	20100n	6207 ZZ	20100d	6307 2RS	20100d
6030 2RS	20100m	61864 M	20100n	6208 2RS	20100d	6307 ZZ	20100d
6030 ZZ	20100m	61868 M	20100n	6208 ZZ	20100d	6308 2RS	20100d
6032 ZZ	20100m	61872 M	20100n	6209 2RS	20100e	6308 ZZ	20100d
6036 M	20100m	61876 MA	20100r	6209 ZZ	20100e	6309 2RS	20100e
6040 M	20100n	61888 M	20100r	6210 2RS	20100e	6309 ZZ	20100e
6044 M	20100n	61892 M	20100r	6210 ZZ	20100e	6310 2RS	20100e
6048 M	20100n	619/1000	20100s	6211 2RS	20100e	6310 ZZ	20100e

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100m

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
6311 2RS	20100e	7309 B	30100a	AH 2352	60200d	AH 3044	60200c
6311 ZZ	20100e	7310 B	30100a	AH 2352 OH	60200d	AH 3044 OH	60200c
6312 2RS	20100f	7311 B	30100a	AH 2356	60200d	AH 3048	60200c
6312 ZZ	20100f	7312 B	30100a	AH 2356 OH	60200d	AH 3048 OH	60200c
6313 2RS	20100f	7313 B	30100a	AH 24024	60200a	AH 3052	60200d
6313 ZZ	20100f	7314 B	30100a	AH 24026	60200a	AH 3052 H	60200d
6314 2RS	20100f	7315 B	30100a	AH 24028	60200a	AH 3052 OH	60200d
6314 ZZ	20100f	7316 B	30100a	AH 24030	60200a	AH 3056	60200d
6315 2RS	20100h	7317 B	30100a	AH 24032	60200b	AH 3056 OH	60200d
6315 ZZ	20100h	7318 B	30100a	AH 24034	60200b	AH 3060	60200d
6316 ZZ	20100h	7319 B	30100a	AH 24036	60200b	AH 3060 OH	60200d
6317 ZZ	20100h	7320 B	30100a	AH 24038	60200b	AH 3064	60200d
6318 ZZ	20100h	7322 B	30100a	AH 24040	60200b	AH 3064 OH	60200d
6320 ZZ	20100k	7328 B	30100a	AH 24122	60200a	AH 3068	60200d
6322 M	20100k	AH 2236	60200b	AH 24124	60200a	AH 3068 OH	60200d
6328 M	20100m	AH 2238	60200b	AH 24126	60200a	AH 3072	60200e
6332 M	20100m	AH 2240	60200b	AH 24128	60200a	AH 3072 OH	60200e
634 ZZ	20100a	AH 2244	60200c	AH 24130	60200a	AH 3076	60200e
635 ZZ	20100a	AH 2248	60200c	AH 24132	60200b	AH 3076 OH	60200e
636 2RS	20100a	AH 2248 OH	60200c	AH 24134	60200b	AH 308	60200a
636 ZZ	20100a	AH 2252	60200d	AH 24136	60200b	AH 3080	60200e
637 2RS	20100a	AH 2252 OH	60200d	AH 24138	60200b	AH 3080 OH	60200e
637 ZZ	20100a	AH 2256	60200d	AH 24140 OH	60200b	AH 3084	60200e
638 ZZ	20100a	AH 2256 OH	60200d	AH 24144 OH	60200c	AH 3084 OH	60200e
639 ZZ	20100a	AH 2260	60200d	AH 24156 OH	60200d	AH 3088	60200e
6646 M	20100n	AH 2260 OH	60200d	AH 24168 OH	60200d	AH 3088 OH	60200e
7005 B	30100a	AH 2264	60200d	AH 24172 OH	60200e	AH 309	60200a
7005 B 2RSR	30100a	AH 2264 OH	60200d	AH 30/500	60200f	AH 3092	60200e
7200 B	30100a	AH 2308	60200a	AH 30/500 OH	60200f	AH 3092 OH	60200e
7201 B	30100a	AH 2309	60200a	AH 30/530	60200f	AH 3096	60200e
7202 B	30100a	AH 2310	60200a	AH 30/530 OH	60200f	AH 3096 OH	60200e
7203 B	30100a	AH 2311	60200a	AH 30/560	60200f	AH 31/500	60200f
7203 B TN	30100a	AH 2312	60200a	AH 30/560 OH	60200f	AH 31/500 OH	60200f
7204 B	30100a	AH 2313	60200a	AH 30/600	60200f	AH 31/530	60200f
7205 B	30100a	AH 2314	60200a	AH 30/600 OH	60200f	AH 31/560	60200f
7206 B	30100a	AH 2315	60200a	AH 30/630	60200f	AH 31/630	60200f
7207 B	30100a	AH 2316	60200a	AH 30/630 OH	60200f	AH 31/750	60200f
7208 B	30100a	AH 2317	60200a	AH 30/670	60200f	AH 31/800	60200f
7209 B	30100a	AH 2318	60200a	AH 30/670 OH	60200f	AH 31/850	60200f
7210 B	30100a	AH 2319	60200a	AH 30/710	60200f	AH 31/900	60200f
7211 B	30100a	AH 2320	60200a	AH 30/710 OH	60200f	AH 31/950	60200f
7212 B	30100a	AH 2322	60200a	AH 30/750	60200f	AH 310	60200a
7213 B	30100a	AH 2324	60200a	AH 30/800	60200f	AH 311	60200a
7214 B	30100a	AH 2326	60200a	AH 30/850	60200f	AH 312	60200a
7215 B	30100a	AH 2328	60200a	AH 30/900	60200f	AH 3122	60200a
7216 B	30100a	AH 2330	60200a	AH 30/950	60200f	AH 3124	60200a
7217 B	30100a	AH 2332	60200b	AH 3024	60200a	AH 3126	60200a
7218 B	30100a	AH 2334	60200b	AH 3026	60200a	AH 3128	60200a
7219 B	30100a	AH 2336	60200b	AH 3028	60200a	AH 313	60200a
7220 B	30100a	AH 2336 OH	60200b	AH 3030	60200a	AH 3130	60200a
7222 B	30100a	AH 2338	60200b	AH 3032	60200b	AH 3132	60200b
7302 B	30100a	AH 2338 OH	60200b	AH 3034	60200b	AH 3134	60200b
7303 B	30100a	AH 2340	60200b	AH 3036	60200b	AH 3136	60200b
7304 B	30100a	AH 2340 OH	60200b	AH 3036 OH	60200b	AH 3136 OH	60200b
7305 B	30100a	AH 2344	60200c	AH 3038	60200b	AH 3138	60200b
7306 B	30100a	AH 2344 OH	60200c	AH 3038 OH	60200b	AH 3138 OH	60200b
7307 B	30100a	AH 2348	60200c	AH 3040	60200b	AH 314	60200a
7308 B	30100a	AH 2348 OH	60200c	AH 3040 OH	60200b	AH 3140	60200b

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100n

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
AH 3140 OH	60200b	AH 3268	60200d	H 2328	60100b	H 3060	60100d
AH 3144	60200c	AH 3268 OH	60200d	H 2330	60100b	H 3060 OH	60100d
AH 3144 OH	60200c	AH 3272	60200e	H 2332	60100b	H 3064	60100d
AH 3148	60200c	AH 3272 OH	60200e	H 2334	60100b	H 3064 OH	60100d
AH 3148 OH	60200c	AH 3276	60200e	H 2336	60100b	H 3068	60100d
AH 315	60200a	AH 3276 OH	60200e	H 2336 OH	60100b	H 3068 OH	60100d
AH 3152	60200d	AH 3280	60200e	H 2338	60100b	H 307	60100a
AH 3152 OH	60200d	AH 3280 OH	60200e	H 2338 OH	60100b	H 3072	60100e
AH 3156	60200d	AH 3284	60200e	H 2340	60100b	H 3072 OH	60100e
AH 3156 OH	60200d	AH 3284 OH	60200e	H 2340 OH	60100b	H 3076	60100e
AH 316	60200a	AH 3288	60200e	H 2344	60100c	H 3076 OH	60100e
AH 3160	60200d	AH 3288 OH	60200e	H 2344 OH	60100c	H 308	60100a
AH 3160 OH	60200d	AH 3292	60200e	H 2348	60100c	H 3080	60100e
AH 3164	60200d	AH 3292 OH	60200e	H 2348 OH	60100c	H 3080 OH	60100e
AH 3164 OH	60200d	AH 3296	60200e	H 2352	60100d	H 3084	60100e
AH 3168	60200d	AH 3296 OH	60200e	H 2352 OH	60100d	H 3084 OH	60100e
AH 3168 OH	60200d	AH 3940	60200b	H 2356	60100d	H 3088	60100e
AH 317	60200a	AH 3952 G	60200d	H 2356 OH	60100d	H 3088 OH	60100e
AH 3172	60200e	AH 3996 OH	60200e	H 30/500	60100f	H 309	60100a
AH 3172 OH	60200e	H 204	60100a	H 30/500 OH	60100f	H 3092	60100e
AH 3176	60200e	H 205	60100a	H 30/530	60100f	H 3092 OH	60100e
AH 3176 OH	60200e	H 206	60100a	H 30/530 OH	60100f	H 3096	60100e
AH 318	60200a	H 207	60100a	H 30/560	60100f	H 3096 OH	60100e
AH 3180	60200e	H 208	60100a	H 30/560 OH	60100f	H 31/500	60100f
AH 3180 OH	60200e	H 209	60100a	H 30/600	60100f	H 31/500 OH	60100f
AH 3184	60200e	H 210	60100a	H 30/600 OH	60100f	H 31/530	60100f
AH 3184 OH	60200e	H 211	60100a	H 30/630	60100f	H 31/560	60100f
AH 3188	60200e	H 212	60100a	H 30/630 OH	60100f	H 31/600	60100f
AH 3188 OH	60200e	H 213	60100a	H 30/670	60100f	H 31/630	60100f
AH 319	60200a	H 214	60100a	H 30/670 OH	60100f	H 31/670	60100f
AH 3192	60200e	H 215	60100a	H 30/710	60100f	H 31/710	60100f
AH 3192 OH	60200e	H 216	60100a	H 30/710 OH	60100f	H 31/750	60100f
AH 3196	60200e	H 217	60100a	H 30/750	60100f	H 31/800	60100f
AH 3196 OH	60200e	H 218	60100a	H 30/800	60100f	H 310	60100a
AH 32/530	60200f	H 219	60100a	H 30/900 OH	60100f	H 311	60100a
AH 32/630	60200f	H 220	60100b	H 3024	60100b	H 312	60100a
AH 32/670	60200f	H 221	60100b	H 3026	60100b	H 3120	60100b
AH 32/710	60200f	H 222	60100b	H 3028	60100b	H 3122	60100b
AH 32/750	60200f	H 2304	60100a	H 3030	60100b	H 3124	60100b
AH 32/800	60200f	H 2305	60100a	H 3032	60100b	H 3126	60100b
AH 32/850	60200f	H 2306	60100a	H 3034	60100b	H 3128	60100b
AH 32/900	60200f	H 2307	60100a	H 3036	60100b	H 313	60100a
AH 32/900	60200f	H 2308	60100a	H 3036 OH	60100b	H 3130	60100b
AH 32/950	60200f	H 2309	60100a	H 3038	60100b	H 3132	60100b
AH 320	60200a	H 2310	60100a	H 3038 OH	60100b	H 3134	60100b
AH 322	60200a	H 2311	60100a	H 304	60100a	H 3136	60100b
AH 3232	60200b	H 2312	60100a	H 3040	60100b	H 3136 OH	60100b
AH 3234	60200b	H 2313	60100a	H 3040 OH	60100b	H 3138	60100b
AH 3236	60200b	H 2314	60100a	H 3044	60100c	H 3138 OH	60100b
AH 3236 OH	60200b	H 2315	60100a	H 3044 OH	60100c	H 314	60100a
AH 3238	60200b	H 2316	60100a	H 3048	60100c	H 3140	60100b
AH 3238 OH	60200b	H 2317	60100a	H 3048 OH	60100c	H 3140 OH	60100b
AH 3240	60200b	H 2318	60100a	H 305	60100a	H 3144	60100c
AH 3240 OH	60200b	H 2319	60100a	H 3052	60100d	H 3144 OH	60100c
AH 3260	60200d	H 2320	60100b	H 3052 OH	60100d	H 3148	60100c
AH 3260 OH	60200d	H 2322	60100b	H 3056	60100d	H 3148 OH	60100c
AH 3264	60200d	H 2324	60100b	H 3056 OH	60100d	H 315	60100a
AH 3264 OH	60200d	H 2326	60100b	H 306	60100a	H 3152	60100d

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100r

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
H 3152 OH	60100d	H 3296	60100e	KM 3	60250b	MB 33	60250a
H 3156	60100d	H 3296 OH	60100e	KM 30	60250b	MB 34	60250a
H 3156 OH	60100d	H 39/500	60100f	KM 31	60250b	MB 36	60250a
H 316	60100a	H 39/530	60100f	KM 32	60250b	MB 38	60250a
H 3160	60100d	H 39/530 OH	60100f	KM 33	60250b	MB 4	60250a
H 3160 OH	60100d	H 39/560	60100f	KM 34	60250b	MB 40	60250a
H 3164	60100d	H 39/560 OH	60100f	KM 36	60250b	MB 44	60250a
H 3164 OH	60100d	H 39/600	60100f	KM 38	60250b	MB 48	60250a
H 3168	60100d	H 39/600 OH	60100f	KM 4	60250b	MB 5	60250a
H 3168 OH	60100d	H 39/630	60100f	KM 40	60250b	MB 52	60250a
H 317	60100a	H 39/630 OH	60100f	KM 42	60250b	MB 56	60250a
H 3172	60100e	H 39/670	60100f	KM 44	60250b	MB 6	60250a
H 3172 OH	60100e	H 39/670 OH	60100f	KM 46	60250b	MB 7	60250a
H 3176	60100e	H 39/710	60100f	KM 48	60250b	MB 8	60250a
H 3176 OH	60100e	H 39/710 OH	60100f	KM 5	60250b	MB 9	60250a
H 318	60100a	H 39/750	60100f	KM 50	60250b	MBL 24	60250a
H 3180	60100e	H 39/800	60100f	KM 52	60250b	MBL 26	60250a
H 3180 OH	60100e	H 3936	60100b	KM 56	60250b	MBL 28	60250a
H 3184	60100e	H 3938	60100b	KM 6	60250b	MBL 30	60250a
H 3184 OH	60100e	H 3940	60100b	KM 7	60250b	MBL 32	60250a
H 3188	60100e	H 3944	60100c	KM 8	60250b	MBL 34	60250a
H 3188 OH	60100e	H 3948	60100c	KM 9	60250b	MBL 36	60250a
H 319	60100a	H 3952	60100d	KML 24	60250b	MBL 38	60250a
H 3192	60100e	H 3956	60100d	KML 26	60250b	MBL 40	60250a
H 3192 OH	60100e	H 3960	60100d	KML 28	60250b	N 1017 M	35200h
H 3196	60100e	H 3964	60100d	KML 30	60250b	N 1024 M	35300e
H 3196 OH	60100e	H 3968	60100d	KML 32	60250b	N 1036 M	35400b
H 32/500	60100f	H 3972	60100e	KML 34	60250b	N 1188	35400f
H 32/500 OH	60100f	H 3976	60100e	KML 36	60250b	N 18/1900	35400k
H 32/530	60100f	H 3980	60100e	KML 38	60250b	N 1892 M	35400f
H 32/560	60100f	H 3984	60100e	KML 40	60250b	N 20/1250 M	35400k
H 32/600	60100f	H 3988	60100e	MB 0	60250a	N 204	35100a
H 32/630	60100f	H 3992	60100e	MB 1	60250a	N 205	35100b
H 32/670	60100f	H 3996	60100e	MB 10	60250a	N 206 EM	35100c
H 32/710	60100f	HE 308	60100a	MB 11	60250a	N 207	35100d
H 32/750	60100f	KM 0	60250b	MB 12	60250a	N 208 EM	35100e
H 32/800	60100f	KM 1	60250b	MB 13	60250a	N 209 M	35100f
H 320	60100b	KM 10	60250b	MB 14	60250a	N 211 M	35200a
H 321	60100b	KM 11	60250b	MB 15	60250a	N 212 EM	35200b
H 322	60100b	KM 12	60250b	MB 16	60250a	N 213	35200c
H 3260	60100d	KM 13	60250b	MB 17	60250a	N 214 E	35200d
H 3260 OH	60100d	KM 14	60250b	MB 18	60250a	N 214 EM	35200d
H 3264	60100d	KM 15	60250b	MB 19	60250a	N 215 EM	35200e
H 3264 OH	60100d	KM 16	60250b	MB 2	60250a	N 216 E	35200f
H 3268	60100d	KM 17	60250b	MB 20	60250a	N 216 EM	35200f
H 3268 OH	60100d	KM 18	60250b	MB 21	60250a	N 217 M	35200h
H 3272	60100e	KM 19	60250b	MB 22	60250a	N 218 EM	35300a
H 3272 OH	60100e	KM 2	60250b	MB 23	60250a	N 218 M	35300a
H 3276	60100e	KM 20	60250b	MB 24	60250a	N 219	35300b
H 3276 OH	60100e	KM 21	60250b	MB 25	60250a	N 220 EM	35300c
H 3280	60100e	KM 22	60250b	MB 26	60250a	N 220 M	35300c
H 3280 OH	60100e	KM 23	60250b	MB 27	60250a	N 221 M	35300d
H 3284	60100e	KM 24	60250b	MB 28	60250a	N 222 M	35300d
H 3284 OH	60100e	KM 25	60250b	MB 29	60250a	N 2220 EM	35300c
H 3288	60100e	KM 26	60250b	MB 3	60250a	N 2222 EM	35300d
H 3288 OH	60100e	KM 27	60250b	MB 30	60250a	N 2234 M	35400b
H 3292	60100e	KM 28	60250b	MB 31	60250a	N 224 EM	35300e
H 3292 OH	60100e	KM 29	60250b	MB 32	60250a	N 224 M	35300e

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100s

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
N 2252 M	35400d	N 332 EM	35400a	NCF 1884 V	35500d	NCF 2916 CV	35500a
N 226 EM	35300f	N 332 M	35400a	NCF 1884 CV	35500d	NCF 2917 CV	35500a
N 226 M	35300f	N 334 EM	35400b	NCF 1888 V	35500d	NCF 2918 CV	35500a
N 228 EM	35300h	N 336 M	35400b	NCF 1888 CV	35500d	NCF 2919 CV	35500b
N 230 EM	35400a	N 340 EM	35400c	NCF 1892 V	35500d	NCF 2920 CV	35500b
N 230 M	35400a	N 344 EM	35400d	NCF 1892 CV	35500d	NCF 2922 CV	35500b
N 2306	35100c	N 348 M	35400d	NCF 1896 V	35500d	NCF 2924 CV	35500b
N 2312	35200b	N 38/630 M	35400h	NCF 1896 CV	35500d	NCF 2926 CV	35500b
N 2316	35200f	N 39/1180 M	35400k	NCF 2204 CV	35500a	NCF 2928 CV	35500b
N 2319 M	35300b	N 39/1320 M	35400k	NCF 2205 CV	35500a	NCF 2930 V	35500b
N 232 EM	35400a	N 39/500 EM	35400h	NCF 2206 CV	35500a	NCF 2930 CV	35500b
N 2322 EM	35300d	N 408 M	35100e	NCF 2207 CV	35500a	NCF 2932 V	35500b
N 2322 M	35300d	N 409 M	35100f	NCF 2208 CV	35500a	NCF 2932 CV	35500b
N 234 EM	35400b	N 410 M	35100h	NCF 2209 CV	35500a	NCF 2934 V	35500b
N 236 EM	35400b	N 411	35200a	NCF 2210 CV	35500a	NCF 2934 CV	35500b
N 236 M	35400b	N 414 M	35200d	NCF 2211 CV	35500a	NCF 2936 V	35500b
N 238 EM	35400c	N 419 M	35300b	NCF 2212 CV	35500a	NCF 2936 CV	35500b
N 238 M	35400c	N 424 M	35300e	NCF 2213 CV	35500a	NCF 2938 V	35500b
N 240 EM	35400c	N 428 EM	35300h	NCF 2214 CV	35500a	NCF 2938 CV	35500b
N 240 M	35400c	N 6/820	35400k	NCF 2215 CV	35500a	NCF 2940 V	35500c
N 244 EM	35400d	NCF 18/1120 V	35500e	NCF 2216 CV	35500a	NCF 2940 CV	35500c
N 244 M	35400d	NCF 18/1400 V	35500e	NCF 2217 CV	35500a	NCF 2944 V	35500c
N 28/1060 M	35400k	NCF 18/500 V	35500e	NCF 2218 CV	35500a	NCF 2944 CV	35500c
N 28/1400 EM	35400k	NCF 18/500 CV	35500e	NCF 2219 CV	35500b	NCF 2948 V	35500c
N 28/630 M	35400h	NCF 18/530 V	35500e	NCF 2220 CV	35500b	NCF 2948 CV	35500c
N 28/710 EM	35400k	NCF 18/530 CV	35500e	NCF 2222 CV	35500b	NCF 2952 V	35500c
N 28/750	35400k	NCF 18/560 V	35500e	NCF 2224 CV	35500b	NCF 2952 CV	35500c
N 29/560	35400h	NCF 18/560 CV	35500e	NCF 2226 CV	35500b	NCF 2956 V	35500c
N 29/850 EM	35400k	NCF 18/600 V	35500e	NCF 2228 CV	35500b	NCF 2956 CV	35500c
N 30/1060	35400k	NCF 18/600 CV	35500e	NCF 2230 CV	35500b	NCF 2960 V	35500c
N 30/670	35400k	NCF 18/630 V	35500e	NCF 2234 CV	35500b	NCF 2960 CV	35500c
N 305 EM	35100b	NCF 18/630 CV	35500e	NCF 2236 CV	35500b	NCF 2964 V	35500c
N 307 E	35100d	NCF 18/670 V	35500e	NCF 2238 CV	35500b	NCF 2964 CV	35500c
N 307 EM	35100d	NCF 18/670 CV	35500e	NCF 2240 CV	35500c	NCF 2968 V	35500d
N 308	35100e	NCF 18/750 V	35500e	NCF 28/500 V	35500e	NCF 2968 CV	35500d
N 309 EM	35100f	NCF 18/800 V	35500e	NCF 28/530 V	35500e	NCF 2972 V	35500d
N 311	35200a	NCF 1840 V	35500c	NCF 28/560 V	35500e	NCF 2972 CV	35500d
N 312 M	35200b	NCF 1840 CV	35500c	NCF 28/750 V	35500e	NCF 2976 V	35500d
N 313 EM	35200c	NCF 1844 V	35500c	NCF 28/800 V	35500e	NCF 2976 CV	35500d
N 313 M	35200c	NCF 1844 CV	35500c	NCF 2896 V	35500d	NCF 2980 V	35500d
N 314 M	35200d	NCF 1848 V	35500c	NCF 29/1000 V	35500e	NCF 2980 CV	35500d
N 315 M	35200e	NCF 1848 CV	35500c	NCF 29/500 V	35500e	NCF 2984 V	35500d
N 316 M	35200f	NCF 1852 V	35500c	NCF 29/500 CV	35500e	NCF 2984 CV	35500d
N 317 M	35200h	NCF 1852 CV	35500c	NCF 29/530 V	35500e	NCF 2988 V	35500d
N 318 EM	35300a	NCF 1856 V	35500c	NCF 29/560 V	35500e	NCF 2988 CV	35500d
N 318 M	35300a	NCF 1856 CV	35500c	NCF 29/600 V	35500e	NCF 2992 V	35500d
N 319 M	35300b	NCF 1860 V	35500c	NCF 29/630 V	35500e	NCF 2992 CV	35500d
N 320 EM	35300c	NCF 1860 CV	35500c	NCF 29/670 V	35500e	NCF 2996 V	35500d
N 320 M	35300c	NCF 1864 V	35500c	NCF 29/710 V	35500e	NCF 2996 CV	35500d
N 321 M	35300d	NCF 1864 CV	35500c	NCF 29/750 V	35500e	NCF 30/500 V	35500e
N 322 EM	35300d	NCF 1868 V	35500d	NCF 29/800 V	35500e	NCF 30/530 V	35500e
N 324 EM	35300e	NCF 1868 CV	35500d	NCF 29/850 V	35500e	NCF 30/560 V	35500e
N 324 M	35300e	NCF 1872 V	35500d	NCF 29/900 V	35500e	NCF 3004 CV	35500a
N 326 EM	35300f	NCF 1872 CV	35500d	NCF 29/950 V	35500e	NCF 3005 CV	35500a
N 326 M	35300f	NCF 1876 V	35500d	NCF 2912 CV	35500a	NCF 3006 CV	35500a
N 328 EM	35300h	NCF 1876 CV	35500d	NCF 2913 CV	35500a	NCF 3007 CV	35500a
N 328 M	35300h	NCF 1880 V	35500d	NCF 2914 CV	35500a	NCF 3008 CV	35500a
N 330 EM	35400a	NCF 1880 CV	35500d	NCF 2915 CV	35500a	NCF 3009 CV	35500a

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100t

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
NCF 3010 CV	35500a	NJ 1028 M	35300h	NJ 219 EM	35300b	NJ 2232 M	35400a
NCF 3011 CV	35500a	NJ 1032 M	35400a	NJ 219 M	35300b	NJ 2234 EM	35400b
NCF 3012 CV	35500a	NJ 1034 M	35400b	NJ 220 E	35300c	NJ 2236 E	35400b
NCF 3013 CV	35500a	NJ 1036 M	35400b	NJ 220 EM	35300c	NJ 2236 EM	35400b
NCF 3014 CV	35500a	NJ 1038 M	35400c	NJ 220 M	35300c	NJ 2236 M	35400b
NCF 3015 CV	35500a	NJ 1040 M	35400c	NJ 2203 E	35100a	NJ 2238 M	35400c
NCF 3016 CV	35500a	NJ 1044 M	35400d	NJ 2204 E	35100a	NJ 224 E	35300e
NCF 3017 CV	35500a	NJ 1048 M	35400d	NJ 2204 EM	35100a	NJ 224 EM	35300e
NCF 3018 CV	35500a	NJ 1052 M	35400d	NJ 2205 E	35100b	NJ 224 M	35300e
NCF 3020 V	35500b	NJ 1056 M	35400e	NJ 2205 EM	35100b	NJ 2240 EM	35400c
NCF 3020 CV	35500b	NJ 1060 M	35400e	NJ 2206 E	35100c	NJ 2252 M	35400d
NCF 3022 CV	35500b	NJ 1064 M	35400e	NJ 2206 EM	35100c	NJ 226 E	35300f
NCF 3024 V	35500b	NJ 1080	35400f	NJ 2207 E	35100d	NJ 226 EM	35300f
NCF 3024 CV	35500b	NJ 18/1120 EM	35400k	NJ 2207 EM	35100d	NJ 226 M	35300f
NCF 3026 V	35500b	NJ 18/1180 EM	35400k	NJ 2207 M	35100d	NJ 228 EM	35300h
NCF 3026 CV	35500b	NJ 18/560 M	35400h	NJ 2208 E	35100e	NJ 228 M	35300h
NCF 3028 V	35500b	NJ 18/630 EM	35400h	NJ 2208 EM	35100e	NJ 230 EM	35400a
NCF 3028 CV	35500b	NJ 18/670	35400k	NJ 2209 E	35100f	NJ 230 M	35400a
NCF 3030 V	35500b	NJ 18/800 EM	35400k	NJ 2209 EM	35100f	NJ 2304 E	35100a
NCF 3030 CV	35500b	NJ 19/530 EM	35400h	NJ 2209 M	35100f	NJ 2304 EM	35100a
NCF 3032 V	35500b	NJ 19/850	35400k	NJ 221 M	35300d	NJ 2305 E	35100b
NCF 3032 CV	35500b	NJ 1938 M	35400c	NJ 2210 E	35100h	NJ 2305 EM	35100b
NCF 3034 V	35500b	NJ 1940 MA	35400c	NJ 2210 EM	35100h	NJ 2306 E	35100c
NCF 3034 CV	35500b	NJ 1944 M	35400d	NJ 2210 M	35100h	NJ 2306 EM	35100c
NCF 3036 V	35500b	NJ 1984 M	35400f	NJ 2211 E	35200a	NJ 2307 E	35100d
NCF 3036 CV	35500b	NJ 203	35100a	NJ 2211 EM	35200a	NJ 2307 M	35100d
NCF 3038 V	35500b	NJ 204 E	35100a	NJ 2211 M	35200a	NJ 2308 E	35100e
NCF 3038 CV	35500b	NJ 204 EM	35100a	NJ 2212 EM	35200b	NJ 2308 EM	35100e
NCF 3040 V	35500c	NJ 205 E	35100b	NJ 2213 EM	35200c	NJ 2309 EM	35100f
NCF 3040 CV	35500c	NJ 205 EM	35100b	NJ 2214 E	35200d	NJ 2309 M	35100f
NCF 3044 V	35500c	NJ 206 E	35100c	NJ 2214 EM	35200d	NJ 2310 E	35100h
NCF 3044 CV	35500c	NJ 206 EM	35100c	NJ 2214 M	35200d	NJ 2310 EM	35100h
NCF 3048 V	35500c	NJ 207 E	35100d	NJ 2215	35200e	NJ 2311 EM	35200a
NCF 3048 CV	35500c	NJ 207 EM	35100d	NJ 2216 E	35200f	NJ 2311 M	35200a
NCF 3052 V	35500c	NJ 207 M	35100d	NJ 2216 EM	35200f	NJ 2312 E	35200b
NCF 3052 CV	35500c	NJ 208 EM	35100e	NJ 2216 M	35200f	NJ 2312 EM	35200b
NCF 3056 V	35500c	NJ 208 M	35100e	NJ 2217 E	35200h	NJ 2312 EMA	35200b
NCF 3056 CV	35500c	NJ 209 E	35100f	NJ 2217 EM	35200h	NJ 2313 EM	35200c
NCF 3060 V	35500c	NJ 209 EM	35100f	NJ 2218 M	35300a	NJ 2314 E	35200d
NCF 3060 CV	35500c	NJ 210 E	35100h	NJ 2219 EM	35300b	NJ 2314 EM	35200d
NCF 3064 V	35500c	NJ 210 EM	35100h	NJ 2219 M	35300b	NJ 2314 M	35200d
NCF 3064 CV	35500c	NJ 210 M	35100h	NJ 222 E	35300d	NJ 2315 E	35200e
NCF 3068 V	35500d	NJ 211 E	35200a	NJ 222 EM	35300d	NJ 2315 EM	35200e
NCF 3068 CV	35500d	NJ 211 EM	35200a	NJ 222 M	35300d	NJ 2315 M	35200e
NCF 3072 V	35500d	NJ 212 E	35200b	NJ 2220 EM	35300c	NJ 2316 E	35200f
NCF 3072 CV	35500d	NJ 212 EM	35200b	NJ 2220 M	35300c	NJ 2316 M	35200f
NCF 3076 V	35500d	NJ 213 E	35200c	NJ 2222 EM	35300d	NJ 2317 E	35200h
NCF 3076 CV	35500d	NJ 213 EM	35200c	NJ 2222 M	35300d	NJ 2317 EM	35200h
NCF 3080 V	35500d	NJ 214 E	35200d	NJ 2224 EM	35300e	NJ 2317 M	35200h
NCF 3080 CV	35500d	NJ 214 EM	35200d	NJ 2224 M	35300e	NJ 2318 E	35300a
NCF 3088 V	35500d	NJ 215 E	35200e	NJ 2226 EM	35300f	NJ 2318 EM	35300a
NCF 3092 V	35500d	NJ 215 EM	35200e	NJ 2226 M	35300f	NJ 2318 M	35300a
NCF 3096 V	35500d	NJ 216 EM	35200f	NJ 2226 MA	35300f	NJ 2319 EM	35300b
NCF3084 V	35500d	NJ 217 E	35200h	NJ 2228 EM	35300h	NJ 2319 M	35300b
NJ 10/500	35400h	NJ 217 EM	35200h	NJ 2228 M	35300h	NJ 232 EM	35400a
NJ 1010 M	35100h	NJ 217 M	35200h	NJ 2230 EM	35400a	NJ 232 M	35400a
NJ 1016 M	35200f	NJ 218 E	35300a	NJ 2230 M	35400a	NJ 2320 E	35300c
NJ 1026 M	35300f	NJ 218 EM	35300a	NJ 2232 EM	35400a	NJ 2320 EM	35300c

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100u

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
NJ 2320 M	35300c	NJ 310 M	35100h	NJ 410 M	35100h	NN 3048 K	35410b
NJ 2322 E	35300d	NJ 311 E	35200a	NJ 411 M	35200a	NN 3056 K M NA	35410b
NJ 2322 EM	35300d	NJ 311 EM	35200a	NJ 412 M	35200b	NN 3076 K M NA	35410b
NJ 2322 M	35300d	NJ 311 M	35200a	NJ 413 M	35200c	NNC 4830 CV	35600b
NJ 2324 EM	35300e	NJ 312 E	35200b	NJ 414 M	35200d	NNC 4832 CV	35600b
NJ 2324 M	35300e	NJ 312 EM	35200b	NJ 415 M	35200e	NNC 4834 CV	35600b
NJ 2326 EM	35300f	NJ 312 M	35200b	NJ 416 M	35200f	NNC 4836 CV	35600b
NJ 2326 M	35300f	NJ 313 E	35200c	NJ 417 M	35200h	NNC 4838 CV	35600b
NJ 2328 E	35300h	NJ 313 EM	35200c	NJ 418 M	35300a	NNC 4840 CV	35600c
NJ 2328 EM	35300h	NJ 313 M	35200c	NJ 420 EM	35300c	NNC 4844 CV	35600c
NJ 2328 M	35300h	NJ 314 E	35200d	NJ 420 M	35300c	NNC 4848 CV	35600c
NJ 2330 EM	35400a	NJ 314 EM	35200d	NJ 421 M	35300d	NNC 4852 CV	35600c
NJ 2330 M	35400a	NJ 314 M	35200d	NJ 422 EM	35300d	NNC 4856 CV	35600c
NJ 2332 EM	35400a	NJ 315 E	35200e	NJ 422 M	35300d	NNC 4860 CV	35600c
NJ 2332 M	35400a	NJ 315 EM	35200e	NJ 424 EM	35300e	NNC 4864 CV	35600c
NJ 2334 EM	35400b	NJ 315 M	35200e	NJ 424 M	35300e	NNC 4868 CV	35600d
NJ 2334 M	35400b	NJ 316 EM	35200f	NJ 428 EM	35300h	NNC 4872 CV	35600d
NJ 234 EM	35400b	NJ 316 M	35200f	NJ 4980 M	35400f	NNC 4876 CV	35600d
NJ 234 M	35400b	NJ 317 E	35200h	NJG 2305 CV	35500a	NNC 4912 CV	35600a
NJ 2344 M	35400d	NJ 317 EM	35200h	NJG 2306 CV	35500a	NNC 4914 CV	35600a
NJ 236 EM	35400b	NJ 317 M	35200h	NJG 2307 CV	35500a	NNC 4916 CV	35600a
NJ 236 M	35400b	NJ 318 E	35300a	NJG 2308 CV	35500a	NNC 4918 CV	35600a
NJ 238 EM	35400c	NJ 318 EM	35300a	NJG 2309 CV	35500a	NNC 4920 CV	35600a
NJ 238 M	35400c	NJ 318 M	35300a	NJG 2310 CV	35500a	NNC 4924 CV	35600b
NJ 240 EM	35400c	NJ 319 E	35300b	NJG 2311 CV	35500a	NNC 4926 CV	35600b
NJ 240 M	35400c	NJ 319 EM	35300b	NJG 2312 CV	35500a	NNC 4928 CV	35600b
NJ 244 EM	35400d	NJ 319 M	35300b	NJG 2313 CV	35500a	NNC 4930 CV	35600b
NJ 244 M	35400d	NJ 320 E	35300c	NJG 2314 CV	35500a	NNC 4932 CV	35600b
NJ 248 M	35400d	NJ 320 EM	35300c	NJG 2316 CV	35500a	NNC 4934 CV	35600b
NJ 252 M	35400d	NJ 320 M	35300c	NJG 2317 CV	35500a	NNC 4936 CV	35600b
NJ 256 M	35400e	NJ 321 M	35300d	NJG 2318 CV	35500a	NNC 4938 CV	35600b
NJ 28/1000 EM	35400k	NJ 322 E	35300d	NJG 2319 CV	35500b	NNC 4940 CV	35600c
NJ 2856 M	35400e	NJ 322 EM	35300d	NJG 2320 CV	35500b	NNC 4944 CV	35600c
NJ 2860 M	35400e	NJ 322 M	35300d	NJG 2322 CV	35500b	NNC 4948 CV	35600c
NJ 2868 M	35400e	NJ 323 M	35300e	NJG 2324 CV	35500b	NNC 4952 CV	35600c
NJ 2892 EM	35400f	NJ 324 EM	35300e	NN 3006 K M NA	35410a	NNC 4956 CV	35600c
NJ 2896 EM	35400h	NJ 324 M	35300e	NN 3007 K M NA	35410a	NNC 4960 CV	35600c
NJ 29/560	35400h	NJ 326 E	35300f	NN 3008 K M NA	35410a	NNC 4964 CV	35600c
NJ 29/630 EM	35400h	NJ 326 EM	35300f	NN 3009 K M NA	35410a	NNC 4968 CV	35600d
NJ 2988 EM	35400f	NJ 326 M	35300f	NN 3010 K M NA	35410a	NNC 4972 CV	35600d
NJ 2992	35400f	NJ 328 EM	35300h	NN 3011 K M NA	35410a	NNC 4976 CV	35600d
NJ 304 EM	35100a	NJ 328 M	35300h	NN 3012 K M NA	35410a	NNC 4980 CV	35600d
NJ 305 E	35100b	NJ 330 EM	35400a	NN 3013 K M NA	35410a	NNC4922 CV	35600a
NJ 305 EM	35100b	NJ 330 M	35400a	NN 3014 K M NA	35410a	NNCF 4830 V	35600b
NJ 305 M	35100b	NJ 332 EM	35400a	NN 3015 K M NA	35410a	NNCF 4860 V	35500c
NJ 306 E	35100c	NJ 332 M	35400a	NN 3016 K M NA	35410a	NNCF 4860 V	35600c
NJ 306 EM	35100c	NJ 334 EM	35400b	NN 3017 K M NA	35410a	NNCF 4860 V	35600c
NJ 307 E	35100d	NJ 334 M	35400b	NN 3018 K M NA	35410a	NNCF 5004 CV	35600a
NJ 307 EM	35100d	NJ 336 M	35400b	NN 3019 K M NA	35410a	NNCF 5005 CV	35600a
NJ 307 M	35100d	NJ 338 M	35400c	NN 3020 K M NA	35410a	NNCF 5006 CV	35600a
NJ 308 E	35100e	NJ 340 EM	35400c	NN 3021 K M NA	35410a	NNCF 5007 CV	35600a
NJ 308 EM	35100e	NJ 340 M	35400c	NN 3022 K M NA	35410a	NNCF 5008 CV	35600a
NJ 308 M	35100e	NJ 344 EM	35400d	NN 3024 K M NA	35410a	NNCF 5009 CV	35600a
NJ 309 E	35100f	NJ 3884 M	35400f	NN 3026 K M NA	35410a	NNCF 5010 CV	35600a
NJ 309 EM	35100f	NJ 406 M	35100c	NN 3028 K M NA	35410a	NNCF 5011 CV	35600a
NJ 309 M	35100f	NJ 407 M	35100d	NN 3030 K M NA	35410a	NNCF 5012 CV	35600a
NJ 310 E	35100h	NJ 408 M	35100e	NN 3034 K M NA	35410a	NNCF 5013 CV	35600a
NJ 310 EM	35100h	NJ 409 M	35100f	NN 3036 K M NA	35410a	NNCF 5014 CV	35600a

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100v

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
NNCF 5015 CV	35600a	NNCL 4964 CV	35600c	NNU 49/630 K M NA	35410b	NU 1064 M	35400e
NNCF 5016 CV	35600a	NNCL 4968 CV	35600d	NNU 4920 K M NA	35410a	NU 1068 M	35400e
NNCF 5017 CV	35600a	NNCL 4972 CV	35600d	NNU 4920 M NA	35410a	NU 1072 M	35400e
NNCF 5018 CV	35600a	NNCL 4976 CV	35600d	NNU 4921 K M NA	35410a	NU 1076 M	35400f
NNCF 5020 CV	35600a	NNCL 4980	35410b	NNU 4922 K M NA	35410a	NU 1080 M	35400f
NNCF 5022 CV	35600a	NNCL 4980 CV	35600d	NNU 4924 K M NA	35410a	NU 1084 M	35400f
NNCF 5024 CV	35600b	NNCL4924 CV	35600b	NNU 4926 K M NA	35410a	NU 1088 M	35400f
NNCF 5026 CV	35600b	NNF 130 PP 2NR	35600b	NNU 4928 K M NA	35410a	NU 1092 M	35400f
NNCF 5028 CV	35600b	NNF 140 PP 2NR	35600b	NNU 4930 K M NA	35410a	NU 1096 M	35400h
NNCF 5030 CV	35600b	NNF 150 PP 2NR	35600b	NNU 4932 K M NA	35410a	NU 12/500 M	35400h
NNCF 5032 CV	35600b	NNF 160 PP 2NR	35600b	NNU 4934 K M NA	35410a	NU 12/560 M	35400h
NNCF 5034 CV	35600b	NNF 170 PP 2NR	35600b	NNU 4944 M NA	35410b	NU 18/1000 M	35400k
NNCF 5036 CV	35600b	NNF 180 PP 2NR	35600b	NNU 4952 M NA	35410b	NU 18/1320 M	35400k
NNCF 5038 CV	35600b	NNF 190 PP 2NR	35600b	NNU 4960 K M NA	35410b	NU 18/1700 EM	35400k
NNCF 5040 CV	35600c	NNF 200 PP 2NR	35600c	NNU 4964 K M NA	35410b	NU 18/600 EM	35400h
NNCF 5044 CV	35600c	NNF 220 PP 2NR	35600c	NNU 4972 M	35410b	NU 18/750 M	35400k
NNCF 5048 CV	35600c	NNF 240 PP 2NR	35600c	NNU 4976 K M NA	35410b	NU 18/900 M	35400k
NNCF 5052 CV	35600c	NNF 260 PP 2NR	35600c	NNU 4984 M	35410b	NU 1864 M	35400e
NNCF 5056 CV	35600c	NNF 300 PP 2NR	35600c	NNU 4992 K M NA	35410b	NU 1876 M	35400f
NNCF 5060 CV	35600c	NNF 5004 PP 2NR	35600a	NU 10/530 M	35400h	NU 1880 M	35400f
NNCF 5064 CV	35600c	NNF 5005 PP 2NR	35600a	NU 10/560 M	35400h	NU 1884	35400f
NNCF 5068 CV	35600d	NNF 5006 PP 2NR	35600a	NU 10/600	35400h	NU 1896 M	35400h
NNCF 5072 CV	35600d	NNF 5007 PP 2NR	35600a	NU 10/630 EM	35400h	NU 19/1320	35400k
NNCF 5076 CV	35600d	NNF 5008 PP 2NR	35600a	NU 10/670	35400k	NU 19/500 EM	35400h
NNCL 4830 CV	35600b	NNF 5009 PP 2NR	35600a	NU 10/710 EM	35400k	NU 19/560 EM	35400h
NNCL 4832 CV	35600b	NNF 5010 PP 2NR	35600a	NU 10/750 EM	35400k	NU 19/600 EM	35400h
NNCL 4834 CV	35600b	NNF 5011 PP 2NR	35600a	NU 10/800 EM	35400k	NU 19/630 EM	35400h
NNCL 4836 CV	35600b	NNF 5012 PP 2NR	35600a	NU 1005	35100b	NU 19/630 M	35400h
NNCL 4838 CV	35600b	NNF 5013 PP 2NR	35600a	NU 1007	35100d	NU 19/670	35400k
NNCL 4840 CV	35600c	NNF 5014 PP 2NR	35600a	NU 1008 M	35100e	NU 19/710	35400k
NNCL 4844 CV	35600c	NNF 5015 PP 2NR	35600a	NU 1009 M	35100f	NU 19/850 EM	35400k
NNCL 4848 CV	35600c	NNF 5016 PP 2NR	35600a	NU 1010 M	35100h	NU 19/900 EM	35400k
NNCL 4852 CV	35600c	NNF 5017 PP 2NR	35600a	NU 1011 M	35200a	NU 1940 EM	35400c
NNCL 4856 CV	35600c	NNF 5018 PP 2NR	35600a	NU 1012 EM	35200b	NU 1948 M	35400d
NNCL 4860 CV	35600c	NNF 5019 PP 2NR	35600a	NU 1012 M	35200b	NU 1956 M	35400e
NNCL 4864 CV	35600c	NNF 5020 PP 2NR	35600a	NU 1013 M	35200c	NU 1964 M	35400e
NNCL 4868 CV	35600d	NNF 5022 PP 2NR	35600a	NU 1014 M	35200d	NU 1968 M	35400e
NNCL 4872 CV	35600d	NNF 5024 PP 2NR	35600b	NU 1016 M	35200f	NU 1980 M	35400f
NNCL 4876 CV	35600d	NNF 5026 PP 2NR	35600b	NU 1017 M	35200h	NU 1988 M	35400f
NNCL 4912 CV	35600a	NNF 5028 PP 2NR	35600b	NU 1018 M	35300a	NU 20/500 EM	35400h
NNCL 4914 CV	35600a	NNF 5030 PP 2NR	35600b	NU 1019 M	35300b	NU 20/530 EM	35400h
NNCL 4916 CV	35600a	NNF 5032 PP 2NR	35600b	NU 1020 M	35300c	NU 20/560 EM	35400h
NNCL 4918 CV	35600a	NNF 5034 PP 2NR	35600b	NU 1021 M	35300d	NU 20/600 EM	35400h
NNCL 4920 CV	35600a	NNF 5036 PP 2NR	35600b	NU 1022 M	35300d	NU 20/630 EM	35400h
NNCL 4922 CV	35600a	NNF 5038 PP 2NR	35600b	NU 1024 M	35300e	NU 20/710 EM	35400k
NNCL 4926 CV	35600b	NNF 5040 PP 2NR	35600c	NU 1026 M	35300f	NU 20/750 EM	35400k
NNCL 4928 CV	35600b	NNF 5044 PP 2NR	35600c	NU 1028 M	35300h	NU 20/800 EM	35400k
NNCL 4930 CV	35600b	NNF 5048 PP 2NR	35600c	NU 1030 M	35400a	NU 202 E	35100a
NNCL 4932 CV	35600b	NNF 5052 PP 2NR	35600c	NU 1032 M	35400a	NU 203 EM	35100a
NNCL 4934 CV	35600b	NNF 5056 PP 2NR	35600c	NU 1034 M	35400b	NU 203 M	35100a
NNCL 4936 CV	35600b	NNF 5060 PP 2NR	35600c	NU 1036 M	35400b	NU 204 E	35100a
NNCL 4938 CV	35600b	NNU 41/500 M	35410b	NU 1038 M	35400c	NU 204 EM	35100a
NNCL 4940 CV	35600c	NNU 41/630 M NA	35410b	NU 1040 M	35400c	NU 205 E	35100b
NNCL 4944 CV	35600c	NNU 4164 M	35410b	NU 1044 M	35400d	NU 205 EM	35100b
NNCL 4948 CV	35600c	NNU 4172 M	35410b	NU 1048 M	35400d	NU 2052 EM	35400d
NNCL 4952 CV	35600c	NNU 4188 M	35410b	NU 1052 M	35400d	NU 2056 M	35400e
NNCL 4956 CV	35600c	NNU 49/500 K M NA	35410b	NU 1056 M	35400e	NU 206 E	35100c
NNCL 4960 CV	35600c	NNU 49/530 K M NA	35410b	NU 1060 M	35400e	NU 206 EM	35100c

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100w

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
NU 2060 M	35400e	NU 2208 EMA	35100e	NU 2268 M	35400e	NU 2330 EM	35400a
NU 2064 M	35400e	NU 2209 E	35100f	NU 2272 M	35400e	NU 2330 M	35400a
NU 207 E	35100d	NU 2209 EM	35100f	NU 2276 EM	35400f	NU 2332 EM	35400a
NU 207 EM	35100d	NU 2209 M	35100f	NU 228 EM	35300h	NU 2332 M	35400a
NU 2072 M	35400e	NU 221 M	35300d	NU 228 M	35300h	NU 2334 EM	35400b
NU 2076 EM	35400f	NU 2210 E	35100h	NU 2280 M	35400f	NU 2334 M	35400b
NU 208 E	35100e	NU 2210 EM	35100h	NU 2292 M	35400f	NU 2336 EM	35400b
NU 208 E	35100e	NU 2210 M	35100h	NU 230 EM	35400a	NU 2336 M	35400b
NU 208 EM	35100e	NU 2211 EM	35200a	NU 230 M	35400a	NU 2338 EM	35400c
NU 208 M	35100e	NU 2211 M	35200a	NU 230 MA	35400a	NU 234 EM	35400b
NU 2080 EM	35400f	NU 2212 E	35200b	NU 2304 E	35100a	NU 234 M	35400b
NU 2084 EM	35400f	NU 2212 EM	35200b	NU 2304 EM	35100a	NU 2340 EM	35400c
NU 2088 EM	35400f	NU 2213 EM	35200c	NU 2305 E	35100b	NU 2340 M	35400c
NU 209 E	35100f	NU 2214 E	35200d	NU 2305 EM	35100b	NU 2344 EM	35400d
NU 2092 EM	35400f	NU 2214 EM	35200d	NU 2306 E	35100c	NU 2344 M	35400d
NU 2096 M	35400h	NU 2215 EM	35200e	NU 2307 E	35100d	NU 2348 M	35400d
NU 210 E	35100h	NU 2215 M	35200e	NU 2307 M	35100d	NU 2352 M	35400d
NU 210 EM	35100h	NU 2216 EM	35200f	NU 2308 E	35100e	NU 2356 M	35400e
NU 211 E	35200a	NU 2216 M	35200f	NU 2308 EM	35100e	NU 236 EM	35400b
NU 211 EM	35200a	NU 2217 EM	35200h	NU 2308 M	35100e	NU 236 M	35400b
NU 212 E	35200b	NU 2218 M	35300a	NU 2309 EM	35100f	NU 2360 M	35400e
NU 212 EM	35200b	NU 2219 EM	35300b	NU 2309 M	35100f	NU 2372	35400e
NU 213 E	35200c	NU 2219 M	35300b	NU 2310 E	35100h	NU 238 EM	35400c
NU 213 EM	35200c	NU 222 EM	35300d	NU 2310 EM	35100h	NU 238 M	35400c
NU 213 M	35200c	NU 222 M	35300d	NU 2311 EM	35200a	NU 240 EM	35400c
NU 214 E	35200d	NU 2220 EM	35300c	NU 2311 M	35200a	NU 240 M	35400c
NU 214 EM	35200d	NU 2220 M	35300c	NU 2312 E	35200b	NU 244 EM	35400d
NU 214 M	35200d	NU 2222 EM	35300d	NU 2312 EM	35200b	NU 244 M	35400d
NU 215 E	35200e	NU 2222 M	35300d	NU 2312 M	35200b	NU 248 M	35400d
NU 215 EM	35200e	NU 2224 EM	35300e	NU 2313 E	35200c	NU 252 M	35400d
NU 216 E	35200f	NU 2224 M	35300e	NU 2313 EM	35200c	NU 256 M	35400e
NU 216 EM	35200f	NU 2226 EM	35300f	NU 2314 E	35200d	NU 260 M	35400e
NU 216 M	35200f	NU 2226 M	35300f	NU 2314 EM	35200d	NU 264 M	35400e
NU 217 E	35200h	NU 2228 EM	35300h	NU 2314 M	35200d	NU 28/500 EM	35400h
NU 217 EM	35200h	NU 2228 M	35300h	NU 2315 E	35200e	NU 28/600 EM	35400h
NU 217 M	35200h	NU 2230 EM	35400a	NU 2315 M	35200e	NU 28/630 M	35400h
NU 218 E	35300a	NU 2230 M	35400a	NU 2316 EM	35200f	NU 28/850 M	35400k
NU 218 EM	35300a	NU 2232 EM	35400a	NU 2316 EMA	35200f	NU 28/900 M	35400k
NU 218 M	35300a	NU 2232 M	35400a	NU 2316 M	35200f	NU 2860 M	35400e
NU 2180 M	35400f	NU 2234 EM	35400b	NU 2317 E	35200h	NU 2864 M	35400e
NU 219 E	35300b	NU 2234 M	35400b	NU 2317 EM	35200h	NU 2888 EM	35400f
NU 219 EM	35300b	NU 2236 EM	35400b	NU 2317 M	35200h	NU 29/1060 EM	35400k
NU 219 M	35300b	NU 2236 M	35400b	NU 2318 E	35300a	NU 29/1180 EM	35400k
NU 220 E	35300c	NU 2238 EM	35400c	NU 2318 EM	35300a	NU 29/1180 M	35400k
NU 220 E	35300c	NU 2238 M	35400c	NU 2318 M	35300a	NU 29/500	35400h
NU 220 EM	35300c	NU 224 EM	35300e	NU 2319 M	35300b	NU 29/630 EM	35400h
NU 220 EM	35300c	NU 224 M	35300e	NU 232 EM	35400a	NU 29/710 EM	35400k
NU 220 M	35300c	NU 2240 EM	35400c	NU 232 M	35400a	NU 29/900 EM	35400k
NU 2203 E	35100a	NU 2240 M	35400c	NU 2320 EM	35300c	NU 29/950	35400k
NU 2204 E	35100a	NU 2244 EM	35400d	NU 2320 M	35300c	NU 2968 M	35400e
NU 2204 EM	35100a	NU 2244 M	35400d	NU 2322 EM	35300d	NU 2980 EM	35400f
NU 2205 E	35100b	NU 2248 M	35400d	NU 2322 M	35300d	NU 2980 M	35400f
NU 2205 EM	35100b	NU 2252 M	35400d	NU 2324 EM	35300e	NU 2984 M	35400f
NU 2206 E	35100c	NU 2256 EM	35400e	NU 2324 M	35300e	NU 2992	35400f
NU 2206 EM	35100c	NU 226 EM	35300f	NU 2326 EM	35300f	NU 30/500	35400h
NU 2206 M	35100c	NU 226 M	35300f	NU 2326 M	35300f	NU 30/630	35400h
NU 2207 E	35100d	NU 2260 M	35400e	NU 2328 EM	35300h	NU 30/670 M	35400k
NU 2207 EM	35100d	NU 2264	35400e	NU 2328 M	35300h	NU 303	35100a

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100x

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
NU 304 EM	35100a	NU 319 M	35300b	NU 428 EM	35300h	NUP 2212 EM	35200b
NU 305 E	35100b	NU 3192	35400f	NU 6/700	35400k	NUP 2213 EM	35200c
NU 305 EM	35100b	NU 3192 M	35400f	NU 60/500 M	35400h	NUP 2214 E	35200d
NU 305 M	35100b	NU 3196 EM	35400h	NUP 10/630 EM	35400h	NUP 2214 EM	35200d
NU 3052 M	35400d	NU 320 EM	35300c	NUP 1040 M	35400c	NUP 2215	35200e
NU 306 E	35100c	NU 320 M	35300c	NUP 1052 M	35400d	NUP 2215 EM	35200e
NU 306 EM	35100c	NU 321 EM	35300d	NUP 1064 M	35400e	NUP 2216 EM	35200f
NU 306 M	35100c	NU 322 E	35300d	NUP 1080 M	35400f	NUP 2216 M	35200f
NU 3060 M	35400e	NU 322 EM	35300d	NUP 1876 M	35400f	NUP 2217 EM	35200h
NU 3064 M	35400e	NU 322 M	35300d	NUP 19/600 EM	35400h	NUP 2218 M	35300a
NU 307 E	35100d	NU 324 EM	35300e	NUP 19/600 M	35400h	NUP 2219 M	35300b
NU 307 EM	35100d	NU 324 M	35300e	NUP 19/670	35400k	NUP 222 E	35300d
NU 307 M	35100d	NU 326 E	35300f	NUP 204 E	35100a	NUP 222 EM	35300d
NU 3072 M	35400e	NU 326 EM	35300f	NUP 204 EM	35100a	NUP 222 M	35300d
NU 3076 EM	35400f	NU 326 M	35300f	NUP 205 E	35100b	NUP 2220 M	35300c
NU 308 E	35100e	NU 328 EM	35300h	NUP 206 E	35100c	NUP 2222 M	35300d
NU 308 EM	35100e	NU 328 M	35300h	NUP 206 EM	35100c	NUP 2224 M	35300e
NU 308 M	35100e	NU 330 EM	35400a	NUP 206 M	35100c	NUP 2226 M	35300f
NU 3080 M	35400f	NU 330 M	35400a	NUP 207 E	35100d	NUP 2228 M	35300h
NU 309 E	35100f	NU 332 EM	35400a	NUP 208 E	35100e	NUP 2230 M	35400a
NU 309 EM	35100f	NU 332 M	35400a	NUP 208 EM	35100e	NUP 2232 M	35400a
NU 309 M	35100f	NU 334 EM	35400b	NUP 209 E	35100f	NUP 2234 EM	35400b
NU 3092 EM	35400f	NU 334 M	35400b	NUP 209 EM	35100f	NUP 2234 M	35400b
NU 3092 M	35400f	NU 336 EM	35400b	NUP 210 E	35100h	NUP 2236 EM	35400b
NU 31/500	35400h	NU 336 M	35400b	NUP 211 E	35200a	NUP 2236 M	35400b
NU 31/530 EM	35400h	NU 338 EM	35400c	NUP 211 EM	35200a	NUP 224 EM	35300e
NU 310 E	35100h	NU 338 M	35400c	NUP 212 E	35200b	NUP 224 M	35300e
NU 310 EM	35100h	NU 340 EM	35400c	NUP 213 E	35200c	NUP 2244 M	35400d
NU 311 EM	35200a	NU 340 M	35400c	NUP 213 EM	35200c	NUP 226 M	35300f
NU 311 EMA	35200a	NU 344 EM	35400d	NUP 213 M	35200c	NUP 228 EM	35300h
NU 312 E	35200b	NU 348 M	35400d	NUP 214 E	35200d	NUP 228 M	35300h
NU 312 EM	35200b	NU 352 M	35400d	NUP 214 EM	35200d	NUP 230 M	35400a
NU 312 M	35200b	NU 356 M	35400e	NUP 215 E	35200e	NUP 2304 EM	35100a
NU 313 E	35200c	NU 360 M	35400e	NUP 216 E	35200f	NUP 2305 E	35100b
NU 313 EM	35200c	NU 39/1060 EM	35400k	NUP 216 M	35200f	NUP 2306 E	35100c
NU 313 M	35200c	NU 405 M	35100b	NUP 217 E	35200h	NUP 2306 EM	35100c
NU 314 E	35200d	NU 406 M	35100c	NUP 217 EM	35200h	NUP 2306 M	35100c
NU 314 EM	35200d	NU 407 M	35100d	NUP 217 M	35200h	NUP 2307 E	35100d
NU 314 M	35200d	NU 408 M	35100e	NUP 218 E	35300a	NUP 2308 E	35100e
NU 315 E	35200e	NU 409 M	35100f	NUP 218 EM	35300a	NUP 2308 EM	35100e
NU 315 EM	35200e	NU 410 M	35100h	NUP 219 EM	35300b	NUP 2309 E	35100f
NU 315 M	35200e	NU 411 M	35200a	NUP 219 M	35300b	NUP 2309 EM	35100f
NU 3152 M	35400d	NU 412 M	35200b	NUP 220 E	35300c	NUP 2309 M	35100f
NU 3156 M	35400e	NU 413 M	35200c	NUP 220 M	35300c	NUP 2310 E	35100h
NU 316 E	35200f	NU 414 M	35200d	NUP 2203 E	35100a	NUP 2311 EM	35200a
NU 316 EM	35200f	NU 415 M	35200e	NUP 2204 E	35100a	NUP 2312 E	35200b
NU 316 M	35200f	NU 416 M	35200f	NUP 2205 E	35100b	NUP 2312 EM	35200b
NU 3164 M	35400e	NU 417 M	35200h	NUP 2205 EM	35100b	NUP 2312 EMA	35200b
NU 317 EM	35200h	NU 418 M	35300a	NUP 2206 E	35100c	NUP 2313 EM	35200c
NU 317 M	35200h	NU 419 M	35300b	NUP 2207 E	35100d	NUP 2314 E	35200d
NU 3172	35400e	NU 420 EM	35300c	NUP 2208 E	35100e	NUP 2316 M	35200f
NU 318 E	35300a	NU 420 M	35300c	NUP 2208 EM	35100e	NUP 2317 EM	35200h
NU 318 EM	35300a	NU 421 M	35300d	NUP 2209 E	35100f	NUP 2318 E	35300a
NU 318 M	35300a	NU 422 EM	35300d	NUP 2210 E	35100h	NUP 2318 M	35300a
NU 3180 M	35400f	NU 422 M	35300d	NUP 2210 EM	35100h	NUP 2319 M	35300b
NU 3184 EM	35400f	NU 424 EM	35300e	NUP 2211 E	35200a	NUP 232 EM	35400a
NU 3188	35400f	NU 424 M	35300e	NUP 2211 EM	35200a	NUP 232 M	35400a
NU 319 EM	35300b	NU 426 M	35300f	NUP 2212 E	35200b	NUP 2320 M	35300c



Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95100z

www.RollwaySmartGuide.com

Page codes index

Item description	Page code	Item description	Page code	Item description	Page code	Item description	Page code
NUP 2322 M	35300d	NUP 336 M	35400b	S6303 2RS	20200a	WJ120/240 M	35300e
NUP 2324 M	35300e	NUP 3988 EM	35400f	S6304 2RS	20200a	WJP 120/240 M	35300e
NUP 2326	35300f	NUP 405 M	35100b	S6305 2RS	20200b		
NUP 2328 M	35300h	NUP 408 M	35100e	S6306 2RS	20200b		
NUP 234 M	35400b	NUP 409 M	35100f	S6307 2RS	20200b		
NUP 2344 M	35400d	NUP 411	35200a	S6308 2RS	20200b		
NUP 236 M	35400b	NUP 412 M	35200b	S6309 2RS	20200b		
NUP 238 M	35400c	NUP 413 M	35200c	S6310 2RS	20200b		
NUP 240 M	35400c	NUP 414 M	35200d	S6311 2RS	20200b		
NUP 244 M	35400d	NUP 415	35200e	S635 2RS	20200a		
NUP 252 M	35400d	NUP 416	35200f	S636 2RS	20200a		
NUP 29/530	35400h	NUP 416 M	35200f	S637 2RS	20200a		
NUP 29/600 M	35400h	NUP 418	35300a	S638 2RS	20200a		
NUP 29/950	35400k	NUP 421 M	35300d	S639 2RS	20200a		
NUP 2992	35400f	NUP 422 M	35300d	S6800 2RS	20200a		
NUP 304 EM	35100a	NUP 6/700	35400k	S6801 2RS	20200a		
NUP 305 EM	35100b	S6000 2RS	20200a	S6802 2RS	20200a		
NUP 305 M	35100b	S6001 2RS	20200a	S6803 2RS	20200a		
NUP 306 E	35100c	S6002 2RS	20200a	S6804 2RS	20200a		
NUP 307 E	35100d	S6003 2RS	20200a	S6805 2RS	20200b		
NUP 307 EM	35100d	S6004 2RS	20200a	S6806 2RS	20200b		
NUP 308 E	35100e	S6005 2RS	20200b	S6807 2RS	20200b		
NUP 308 EM	35100e	S6006 2RS	20200b	S6808 2RS	20200b		
NUP 309 E	35100f	S6007 2RS	20200b	S6809 2RS	20200b		
NUP 309 EM	35100f	S6008 2RS	20200b	S6810 2RS	20200b		
NUP 310 E	35100h	S6009 2RS	20200b	S6811 2RS	20200b		
NUP 310 EM	35100h	S6010 2RS	20200b	S6812 2RS	20200b		
NUP 311 E	35200a	S6011 2RS	20200b	S6813 2RS	20200b		
NUP 311 EM	35200a	S6012 2RS	20200b	S6814 2RS	20200b		
NUP 312 E	35200b	S6013 2RS	20200b	S6815 2RS	20200b		
NUP 312 EM	35200b	S6014 2RS	20200b	S6816 2RS	20200b		
NUP 312 M	35200b	S605 2RS	20200a	S685 2RS	20200a		
NUP 313 E	35200c	S606 2RS	20200a	S686 2RS	20200a		
NUP 313 EM	35200c	S607 2RS	20200a	S687 2RS	20200a		
NUP 314 E	35200d	S608 2RS	20200a	S688 2RS	20200a		
NUP 314 EM	35200d	S609 2RS	20200a	S689 2RS	20200a		
NUP 314ENM	35200d	S6200 2RS	20200a	S6900 2RS	20200a		
NUP 315 E	35200e	S6201 2RS	20200a	S6901 2RS	20200a		
NUP 315 EM	35200e	S6202 2RS	20200a	S6902 2RS	20200a		
NUP 316 M	35200f	S6203 2RS	20200a	S6903 2RS	20200a		
NUP 317 EM	35200h	S6204 2RS	20200a	S6904 2RS	20200a		
NUP 318 E	35300a	S6205 2RS	20200b	S6905 2RS	20200b		
NUP 318 EM	35300a	S6206 2RS	20200b	S6906 2RS	20200b		
NUP 319	35300b	S6207 2RS	20200b	S6907 2RS	20200b		
NUP 320 M	35300c	S6208 2RS	20200b	S6908 2RS	20200b		
NUP 322 E	35300d	S6209 2RS	20200b	S6909 2RS	20200b		
NUP 322 EM	35300d	S6210 2RS	20200b	S6910 2RS	20200b		
NUP 322 M	35300d	S6211 2RS	20200b	S6911 2RS	20200b		
NUP 324 EM	35300e	S6212 2RS	20200b	S6912 2RS	20200b		
NUP 324 M	35300e	S6213 2RS	20200b	S6913 2RS	20200b		
NUP 326 E	35300f	S625 2RS	20200a	S6914 2RS	20200b		
NUP 326 EM	35300f	S626 2RS	20200a	S6915 2RS	20200b		
NUP 326 M	35300f	S627 2RS	20200a	S6916 2RS	20200b		
NUP 328 EM	35300h	S628 2RS	20200a	S695 2RS	20200a		
NUP 328 M	35300h	S629 2RS	20200a	S696 2RS	20200a		
NUP 330 M	35400a	S6300 2RS	20200a	S697 2RS	20200a		
NUP 332 M	35400a	S6301 2RS	20200a	S698 2RS	20200a		
NUP 334	35400b	S6302 2RS	20200a	S699 2RS	20200a		

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

ROLLWAY®



95500a

Standard terms and conditions of: Sale – Products & Services

www.RollwaySmartGuide.com

REGAL BELOIT BELGIUM nv. T&C_Edition 03/2015

continue ►

1. DEFINITIONS:

In these Terms and Conditions of Sale, "Seller" means REGAL BELOIT BELGIUM nv, "Buyer" means the person, firm, company or corporation by whom the order is given.

2. THE CONTRACT:

2.1 All orders must be in writing and are accepted subject to these Terms and Conditions of Sale. No terms or conditions put forward by Buyer and no representations, warranties, guarantees or other statements not contained in Seller's quotation or Acknowledgement of Order nor otherwise expressly agreed in writing by Seller shall be binding on Seller.

2.2 The Contract shall become effective only upon the date of acceptance of Buyer's order on Seller's Acknowledgement of Order form or upon the date of fulfilment of all conditions precedent stipulated in the Contract, whichever is the later (the "Effective Date"). If the details of the Goods described in Seller's quotation differ from those set out in the Acknowledgement of Order Form the latter shall apply.

2.3 No alteration or variation to the Contract shall apply unless agreed in writing by both parties. However, Seller reserves the right to effect minor modifications and/or improvements to the Goods before delivery provided that the performance of the Goods is not adversely affected and that neither the Contract Price nor the delivery date is affected.

3. VALIDITY OF QUOTATION AND PRICES:

3.1 Unless previously withdrawn, Seller's quotation is open for acceptance within the period stated therein or, when no period is so stated, within thirty days after its date.

3.2 Prices are firm for delivery within the period stated in Seller's quotation and are exclusive of (a) Value Added Tax and (b) any similar and other taxes, duties, levies or other like charges arising outside Belgium in connection with the performance of the Contract.

3.3 Prices (a) are for Goods delivered EXW (Ex works) Seller's shipping point, exclusive of freight, insurance and handling unless otherwise stated in the Seller's order confirmation.

4. PAYMENT:

4.1 Payment shall be made: (a) in full without set-off, counterclaim or withholding of any kind (save where and to the extent that this cannot by law be excluded); and (b) in the currency of Seller's order confirmation within thirty days of date of invoice unless otherwise specified by Seller's Finance Department. Goods will be invoiced at any time after their readiness for dispatch has been notified to Buyer. Without prejudice to Seller's other rights, Seller reserves the right to: (i) charge interest on any overdue sums at 4% above the base lending rate of Fortis Bank, Brussels (or such higher rate stipulated by applicable law) during the period of delay; (ii) suspend performance of the Contract (including withholding shipment) in the event that Buyer fails or in Seller's reasonable opinion it appears that Buyer is likely to fail to make payment when due under the Contract or any other contract; and (iii) at any time require such reasonable security for payment as Seller may deem reasonable.

5. DELIVERY PERIOD:

5.1 Unless otherwise stated in Seller's order confirmation, all periods stated for delivery or completion run from the Effective Date and are to be treated as estimates only not involving any contractual obligations.

5.2 If Seller is delayed in or prevented from performing any of its obligations under the Contract due to the acts or omissions of Buyer or its agents (including but not limited to failure to provide specifications and/or fully dimensioned working drawings and/or such other information as Seller reasonably requires to proceed expeditiously with its obligations under the Contract), the delivery/completion period and the Contract Price shall both be adjusted accordingly.

5.3 If delivery is delayed due to any act or omission of Buyer, or if having been notified that the Goods are ready for despatch, Buyer fails to take delivery or provide adequate shipping instructions, Seller shall be entitled to place the Goods into a suitable store at Buyer's expense. Upon placing the Goods into the store, delivery shall be deemed to be complete, risk in the Goods shall pass to Buyer and Buyer shall pay Seller accordingly.

6. FORCE MAJEURE:

6.1 Force Majeure of any kind, unforeseeable production, traffic or shipping disturbances, war, acts of terrorism, fire, floods, unforeseeable shortages of labor, utilities or raw materials and supplies, strikes, lockouts, acts of government, and any other hindrances beyond the control of the party obliged to

perform which diminish, delay or prevent production, shipment, acceptance or use of the goods, or make it an unreasonable proposition, shall relieve the party from its obligation to supply or take delivery, as the case may be, as long as and to the extent that the hindrance prevails. If, as a result of the hindrance, supply and/or acceptance is delayed by more than eight weeks, either party shall have

the right to cancel the contract. Should the Seller's suppliers fail to supply him in whole or in part, the Seller shall not be under obligation to purchase from other sources. In such cases, the Seller shall have the right to distribute the available quantities among his customers while at the same time taking into account his captive requirements.

7. DELIVERY, RISK & TITLE:

7.1 Unless otherwise expressly stated in the Contract, the Goods will be delivered

red Ex Works to the destination named in the Contract. Risk of loss of or damage to the Goods shall pass to Buyer upon delivery as aforesaid and Buyer shall be responsible for insurance of the Goods after risk has so passed. Delivery terms used in the Contract shall be defined in accordance with the latest version of Incoterms.

7.2 Title to the Goods shall pass to Buyer upon delivery in accordance with Clause 7.1.

7.3 Claims for shortfalls in quantity or for incorrect delivery shall be void if made more than 14 days after receipt by the customer.

8. DEFECTS AFTER DELIVERY:

8.1 Seller warrants (i) subject to the other provisions of the Contract, good title to and the unencumbered use of the Goods; (ii) that Goods manufactured by Seller and/or Seller's Affiliates shall conform with Seller's specifications therefore and be free of defects in materials and workmanship. Seller will make good by the supply of a replacement part or parts, any defects which, under proper use, care and maintenance, appear in Goods of Seller's Affiliates' manufacture and which are reported to Seller within 12 calendar months after their delivery (the "Warranty Period") and which arise solely from faulty materials or workmanship: provided always that defective items are returned to Seller at Buyer's cost carriage and insurance prepaid within the Warranty Period. Repaired or replacement items will be delivered by Seller at Seller's cost to Buyer. Goods replaced in accordance with this Clause 10.1 shall be subject to the foregoing warranty for the unexpired portion of the Warranty Period or for ninety days from the date of their return to Buyer (or completion of correction in the case of Services), whichever expires the later.

8.2 Notwithstanding Clause 8.1, Seller shall not be liable for any defects caused by: fair wear and tear; materials or workmanship made, furnished or specified by Buyer; non-compliance with Seller's storage, installation, operation or environmental requirements; lack of proper maintenance; any modification or repair not previously authorised by Seller in writing. Seller's costs incurred in investigating and rectifying such defects shall be paid by Buyer upon demand. Buyer shall at all times remain solely responsible for the adequacy and accuracy of all information supplied by it.

8.3 Subject to Clause 10.1, the foregoing constitutes Seller's sole warranty and Buyer's exclusive remedy for breach thereof. No representations, warranties or conditions of any kind, express or implied, shall apply as to satisfactory quality, merchantability, fitness for any particular purpose or any other matter with respect to any of the Goods.

9. PATENT, ETC. INFRINGEMENT:

9.1 Subject to the limitations set forth in Clause 10, Seller shall indemnify Buyer in the event of any claim for infringement of Letters Patent, Registered Design, Design Right, Trade Mark or Copyright ("Intellectual Property Rights") existing at the date of formation of the Contract arising from the use or sale of the Goods, against all reasonable costs and damages awarded against Buyer in any action for such infringement, or for which Buyer may become liable in any such action, provided always that Seller shall not be liable to so indemnify Buyer in the event that: (i) such infringement arises as a result of Seller having followed a design or instruction furnished or given by Buyer, or the Goods having been used in a manner or for a purpose or in a country not specified by or disclosed to Seller prior to the date of the Contract or in association or combination with any other equipment or software, or (ii) Seller has at its expense procured for Buyer the right to continue to use the Goods or has modified or replaced the Goods so that the Goods no longer infringe.

(iii) Buyer has failed to give Seller the earliest possible notice in writing of any claim made or to be made or of any action threatened or brought against Buyer and/or Buyer has failed to permit Seller, at Seller's expense, to conduct and control any litigation that may ensue and all negotiations for a settlement of the claim, or

(iv) Buyer has made without Seller's prior written consent any admission which is or may be prejudicial to Seller in respect of any such claim or action, or

(v) the Goods have been modified without Seller's prior written authorisation.

9.2 Buyer warrants that any design or instructions furnished or given by it shall not cause Seller to infringe any Intellectual Property Rights in the performance of Seller's obligations under the Contract and shall indemnify Seller against all reasonable costs and damages which Seller may incur as a result of any breach of such warranty.

10. LIMITATION OF LIABILITY:

Supplier's maximum aggregate liability for any and all losses, liabilities, expenses (including legal expenses), damages, claims or actions incurred under or in connection with a specific order or a particular blanket order (CALL-OFF order) issued, arising in or by virtue of breach of contract, tort (including negligence), misrepresentation, breach of statutory duty, strict liability, infringement of intellectual property rights or otherwise, shall in no circumstances exceed a sum equal to the total price of the Call-Off in question.

11. STATUTORY AND OTHER REGULATIONS:

11.1 If Seller's obligations under the Contract shall be increased or reduced by reason of the making or amendment after the date of Seller's quotation of any law or any order, regulation or bye-law having the force of law that shall affect the performance of Seller's obligations under the Contract, the Contract Price and delivery period shall be adjusted accordingly and/or performance of the Contract suspended or terminated, as appropriate.

continue ►

Deep Groove Ball Bearing	Self-Aligning Ball Bearing	Angular Contact Ball Bearing	
Cylindrical Roller Bearing	Tapered Roller Bearing	Spherical Roller Bearing	
Thrust Ball Bearing	Spherical Roller Thrust Bearing	Accessories Adapter & Withdrawal Sleeve	Technical & Related Information

[◀ back](#)

12. COMPLIANCE WITH LAWS

Buyer agrees that all applicable import, export control and sanctions laws, regulations, orders and requirements, as they may be amended from time to time, including without limitation those of the United States, the European Union and the jurisdictions in which Seller and Buyer are established or from which items may be supplied, and the requirements of any licenses, authorisations, general licences or licence exceptions relating thereto will apply to its receipt and use of goods. In no event shall Buyer use, transfer, release, export or re-export any such goods in violation of such applicable laws, regulations, orders or requirements or the requirements of any licences, authorisations or licence exceptions relating thereto. Buyer agrees furthermore that it shall not engage in any activity that would expose the Seller to a risk of penalties under laws and regulations of any relevant jurisdiction prohibiting improper payments, including but not limited to bribes, to officials of any government or of any agency, instrumentality or political subdivision thereof, to political parties or political party officials or candidates for public office, or to any employee of any customer or supplier. Buyer agrees to comply with all appropriate legal, ethical and compliance requirements.

13. DEFAULT, INSOLVENCY AND CANCELLATION:

Seller shall be entitled, without prejudice to any other rights it may have, to cancel the Contract forthwith, wholly or partly, by notice in writing to Buyer, if (a) Buyer is in default of any of its obligations under the Contract and fails, within 30 (thirty) days of the date of Seller's notification in writing of the existence of the default, either to rectify such default if it is reasonably capable of being rectified within such period or, if the default is not reasonably capable of being rectified within such period, to take action to remedy the default or (b) on the occurrence of an Insolvency Event in relation to Buyer. "Insolvency Event" in relation to Buyer means any of the following: (i) a meeting of creditors of Buyer being held or an arrangement or composition with or for the benefit of its creditors being proposed by or in relation to Buyer; (ii) a chargeholder, receiver, administrative receiver or similar person taking possession of or being appointed over or any distress, execution or other process being levied or enforced (and not being discharged within seven days) on the whole or a material part of the assets of Buyer; (iii) Buyer ceasing to carry on business or being unable to pay its debts; (iv) Buyer or its directors or the holder of a qualifying floating charge giving notice of their intention to appoint, or making an application to the court for the appointment of, an administrator; (v) a petition being presented (and not being discharged within 28 days) or a resolution being passed or an order being made for the administration or the winding-up, bankruptcy or dissolution of Buyer; or (vi) the happening in relation to Buyer of an event analogous to any of the above in any jurisdiction in which it is incorporated or resident or in which it carries on business or has assets. Seller shall be entitled to recover from Buyer or Buyer's representative all costs and damages incurred by Seller as a result of such cancellation, including a reasonable allowance for overheads and profit (including but not limited to loss of prospective profits and overheads).

14. MISCELLANEOUS:

14.1 No waiver by either party with respect to any breach or default or of any right or remedy and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default or of any other right or remedy, unless such waiver be expressed in writing and signed by the party to be bound.

14.2 If any clause, sub-clause or other provision of the Contract is invalid under any statute or rule of law, such provision, to that extent only, shall be deemed to be omitted without affecting the validity of the remainder of the Contract.

14.3 Buyer shall not be entitled to assign its rights or obligations hereunder without the prior written consent of Seller.

14.4 Seller enters into the Contract as principal. Buyer agrees to look only to Seller for due performance of the Contract.

14.5 GOODS PROVIDED HEREUNDER ARE NOT SOLD OR INTENDED FOR USE IN ANY NUCLEAR OR NUCLEAR RELATED APPLICATIONS. Buyer (i) accepts Goods in accordance with the foregoing restriction, (ii) agrees to communicate such restriction in writing to any and all subsequent purchasers or users and (iii) agrees to defend, indemnify and hold harmless Seller from any and all claims, losses, liabilities, suits, judgements and damages, including incidental and consequential damages, arising from use of Goods in any nuclear or nuclear related applications, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability.

14.6 The Contract shall in all respects be construed in accordance with the laws of Belgium excluding, however, any effect on such laws of the 1980 Vienna Convention on Contracts for the International Sale of Goods and to the fullest extent permitted by law, shall be without regard to any conflict of laws or rules which might apply the laws of any other jurisdiction. All disputes arising out of the Contract shall be subject to the exclusive jurisdiction of the Belgian courts.

14.7 The headings to the Clauses and paragraphs of the Contract are for guidance only and shall not affect the interpretation thereof.

14.8 All notices and claims in connection with the Contract must be in writing.

[◀ back](#)