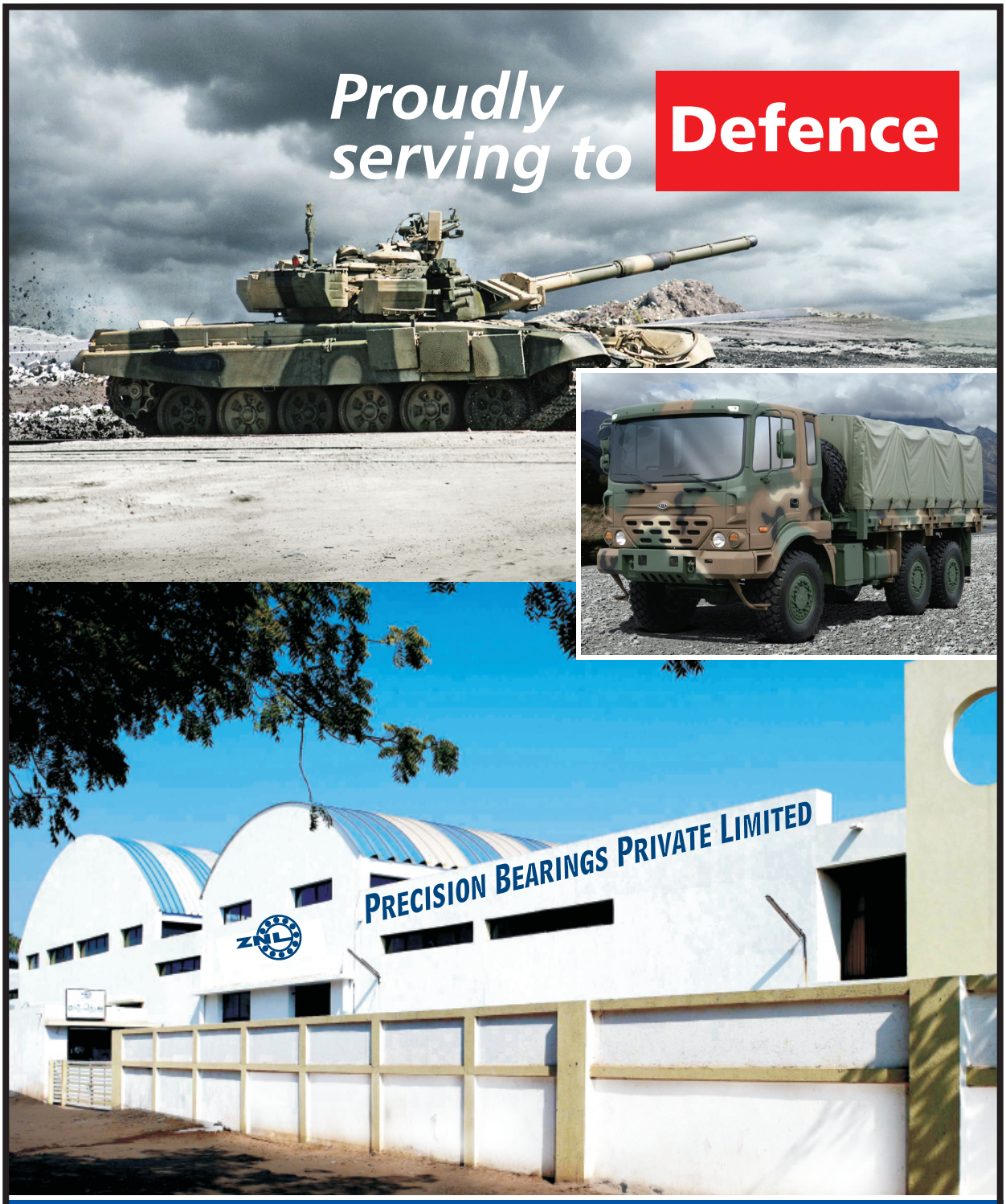
The Commitment to Quality...
The Commitment to Growth...

PRECISION BEARINGS PVT. LTD.



“Friction Free Revolution”

Voice of Chairman

On this momentous occasion of revision of catalogue, I extend my heart felt gratitude to my organization and associates for working with us to overcome challenges with determination and grit. Working together we have added many feathers of rare achievement in our cap and we have emerged as a much better, more professional organization.

The stupendous growth achieved by Precision Bearings is rooted in a long list of sophisticated techniques evolved by us which has added to our professionalism. And, all this is not at the cost of environment. All our producers are green ecologically friendly. Our constant endeavors have earned a huge list of clientele who have placed their full trust in us.

Precision Bearings had started its journey with a production capacity of 12,000 bearings per month with 40 employees. Today, the company produces more than 4, 00,000 bearings per month with 300 employees and 3600 designs of quality bearings.

I welcome you all to join us in this dream run of success. All our achievements and accomplishments were possible with help of the huge support and inspiration provided to us by our associates. Let's now head towards a new horizon and emerge as the market leader.

"Focus on a few key objectives … I only have three things to do. I have to choose the right people, allocate the right number of dollars, and transmit ideas from one division to another with the speed of light. So I'm really in the business of being the gatekeeper and the transmitter of ideas." – JACK WELCH

DANESH SHAH

Index

1. Principles of Bearing Selection and Application 4

2. Different Types of Bearing 11

3. Selection of Bearing Types 21
Available Space 22
Loads 22
Misalignment 22
Speed 22
Axial Displacement 23
Mounting and Dismounting 23
4. Selection of Bearing Size 25
Load Rating & Life 26
Dynamic Bearing Load 27
Static Load Carrying Capacity 28
5. Speed and Vibration 29
Reference Speed 30
Limiting Speed 31
Vibration Generation in a Bearing 32
Influence of the bearing on the Vibration behavior of the application 32
6. Formulation of Bearing Number 33
7. Bearing Data – General 41
Dimensions 42
Tolerances 43
Bearing Internal Clearance 45
Material for Rolling Bearings 45
Cages 47
8. Application of Bearings 73
Bearing Arrangements 74
Radial Location of Bearings 75
Axial Location of Bearings 76
Bearing Preload 77
9. Lubrication 105
Grease Lubrication 106
Lubricating Grease 108
Oil Lubrication 112

Index

10. Mounting and Dismounting 115
Bearing Handling 116
Bearing Mounting 116
Dismounting 117
11. Reference Standards used for Bearings 121
12. Deep groove ball bearing 125
Deep groove ball bearing single row 128
Sealed single row deep groove ball bearing 136
Deep groove ball bearing with filling slots and snap ring 143
Deep groove ball bearing double row 144
Miniature ball bearing 145
13. Angular contact ball bearing 149
Angular contact ball bearing – Single row 151
ZNL spindle bearing 153
Angular contact ball bearing – Double row 157
Angular contact ball bearing – Sealed double row 159
Angular contact ball bearing – Double row with shield 160
14. Self aligning ball bearing 161
15. Four point contact ball bearing 167
16. Thrust ball bearing 171
17. Cylindrical roller bearing 177
Cylindrical roller bearing 179
L Type loose rib 187
18. Full compliment cylindrical roller bearing 191
Full component cylindrical roller bearing – Single row semi locating 193
Full component cylindrical roller bearing – locating and non locating bearing 196
Full component cylindrical roller bearing – Sealed double row 197
19. Taper roller bearing 201
Taper roller bearing – Single row – metric 203
Taper roller bearing – Single row – inch 211
Taper roller bearing – Double outer race – inch 228
Taper roller bearing – Double inner race – inch 247
Taper roller bearing – Single row paired face-to-face 251
Taper roller bearing – Single row paired back-to-back 254

Index

20. Spherical roller bearing 257
Spherical roller bearing 260
Spherical roller bearing – E type 272
Spherical roller bearing – sealed 274
Spherical roller bearing – Single row sealed 276
Roller bearing units (insert bearing / collar mounted) 277
Spherical roller bearing for vibratory applications 278
Plain spherical bearing 280
21. Spherical roller thrust bearing 285
Spherical roller thrust bearing – Metal cage 287
Spherical roller thrust bearing – Steel cage 289
22. Needle roller bearing 291
Needle roller bearing – with flange – without inner ring 293
Needle roller bearing – with flange – with inner ring 298
Needle roller and cage assembly 302
Drawn cup needle roller bearing 306
23. Ball bearing units and insert bearing 313
Insert bearing 315
Pillow block 317
Square flange units 320
Oval flange units 323
Take up units 326
Round flange units 329
24. Bearing Accessories 331
Adapter Sleeves 332
Withdrawal Sleeves 335
Lock Nuts 337
Cylindrical Roller 339
Needle Roller 340
Steel Ball 341
25. Special Bearing 343

Precision Bearings Private Limited (ZNL) is one of the leading manufacturers of ball bearings in India covering more than 3000 different sizes in spherical, taper, cylindrical, taper thrust, angular contact and other types of roller bearings. With the most advanced manufacturing technology and quality control systems, ZNL meets the ISO/TS – 16949 – 2009 and the ISO 9001:2008 quality control standards. ZNL contributes to add new sizes to its existing portfolio based on customer demands. With a strong application engineering team ZNL has succeeded in helping a lot of customers with hard to find bearings.

With fully equipped Chemical & metallurgical laboratory and standard room facilities, ZNL Bearings are designed as per BS/ISO DIN Standards to perform well in a variety of applications like construction, mining, material handling equipments, farm machinery, reduction gear boxes, mechanical power transmission equipments, crusher, oil field equipment, wood working machinery, crane & hoist, rolling mill machinery, textile machinery, paper machinery, printing machinery, fan & blower, automatic axle, railways and a wide range of other industrial machinery.

ZNL also produces special bearings based on customer drawings and is also capable of reverse engineering samples to manufacture the same.

We always study and analyze our customer's need and their difficulties, and try to provide them the best suitable product on a cost effective and affordable price.

ZNL also produces special bearings based on customer drawings and is also capable of doing Reverse Engineering to manufacture the same.

TECHNICAL SUPPORT

Even for special requirement, our response is immediate and our Application Engineer team always be at customer's doorsteps to understand their needs. This facilitates to develop a strong relationship bond between the two companies. International Standard Organization (ISO) has set up the international standards for the bearing industries. The standardization of boundary dimensions and tolerances allows the bearing manufacturer to utilize the most modern production machinery and quality control techniques in producing high quality bearings at an economical price level.

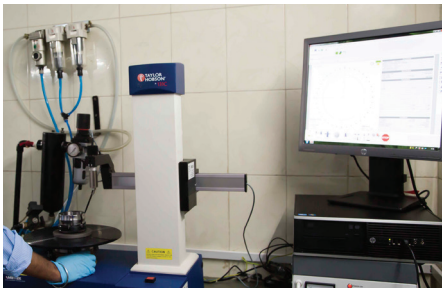
MANUFACTURING CAPABILITY

- Fully Automatic Grinding line for Taper Roller bearing and Ball bearing.
- Fully Automatic Assembly line for Taper Roller bearing and Ball bearing.
- CNC Machines for Internal & External Grindings.
- Super finishing machines for Inner raceway , Outer raceway & Roller OD.
- HAAS CNC & VMC machine for Tool preparation.

ZNL manufactures bearings according to standard Tolerances (P0 , P6 & P5) and on Normal Class Clearance. For specific requirements, ZNL can produce C2, C3, or C4 Clearance bearings. In addition ZNL has the equipments for super finishing of track for the bearing rings as well as rollers. Each bearing component i.e. inner and outer Rings and rollers have super finish which helps in achieving maximum bearing life.

QUALITY

Quality is an integral part of our culture and every effort is made to ensure that customer get value for money. "Zero Defects" is our quality objective. We are working towards this objective everyday. ZNL follows "In process" quality control technique at each stage of manufacturing to achieve high standards. Our quality control room consists of the highest industry standard instruments like life testing, noise checking, vibration checking, Eddy current testing for crack, crowning checking, roundness tester, surface finish tester, profile projector and other calibrating equipments for the standard room. ZNL also has a full-fledged laboratory for micro-structure and chemical analysis. 100% inspection of ID, OD, Width, radial clearance, and noise is done for all bearings.



DESIGN

Design is also an integral part of our culture and every effort is made by Design team to ensure Design is as per IS/ISO DIN Standard which also take cares of Specific requirement if any given by customers. To achieve this Design level, we are using integral Design software, Autocad & ProE and also doing Design verification and Validation at initial stage.

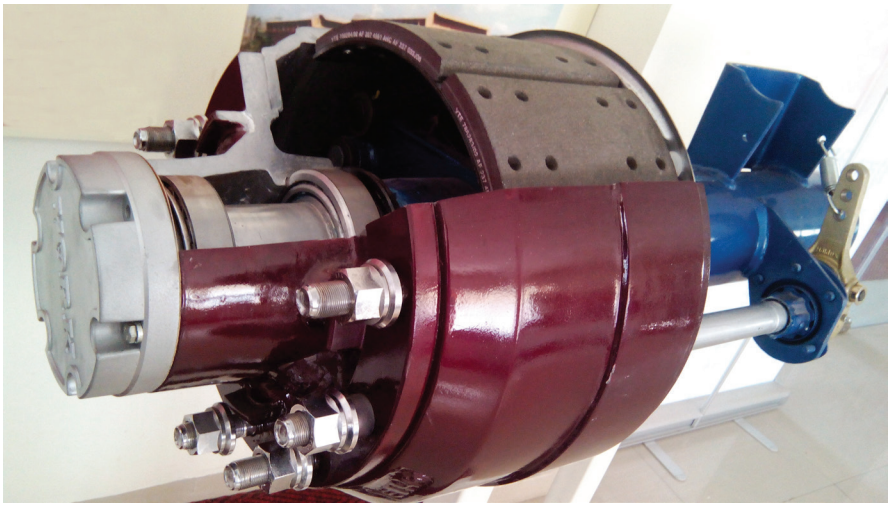
R & D

We have Fully computerized three Endurance testing/ Life testing machines for Ball bearing, TRB, SRB & CRB. For New Development items, if customer requires Life testing of Bearing then we can do for customer.

We have also fully equipped Metallurgical Lab which consists of Spectrometer, Microscope, Rockwell & Vicker Hardness tester for ensuring the metallurgical part of Bearing.

APPLICATION ENGINEERING

ZNL has a strong team of application engineers willing to understand your application needs and provide appropriate solutions by selecting the right bearing which fits your needs. ZNL's application engineering approach has helped gain a lot of customer's confidence about our practical knowledge of the field of bearings. Our design team is capable of designing a customized solution for your needs and manufacturing it in a cost effective way.



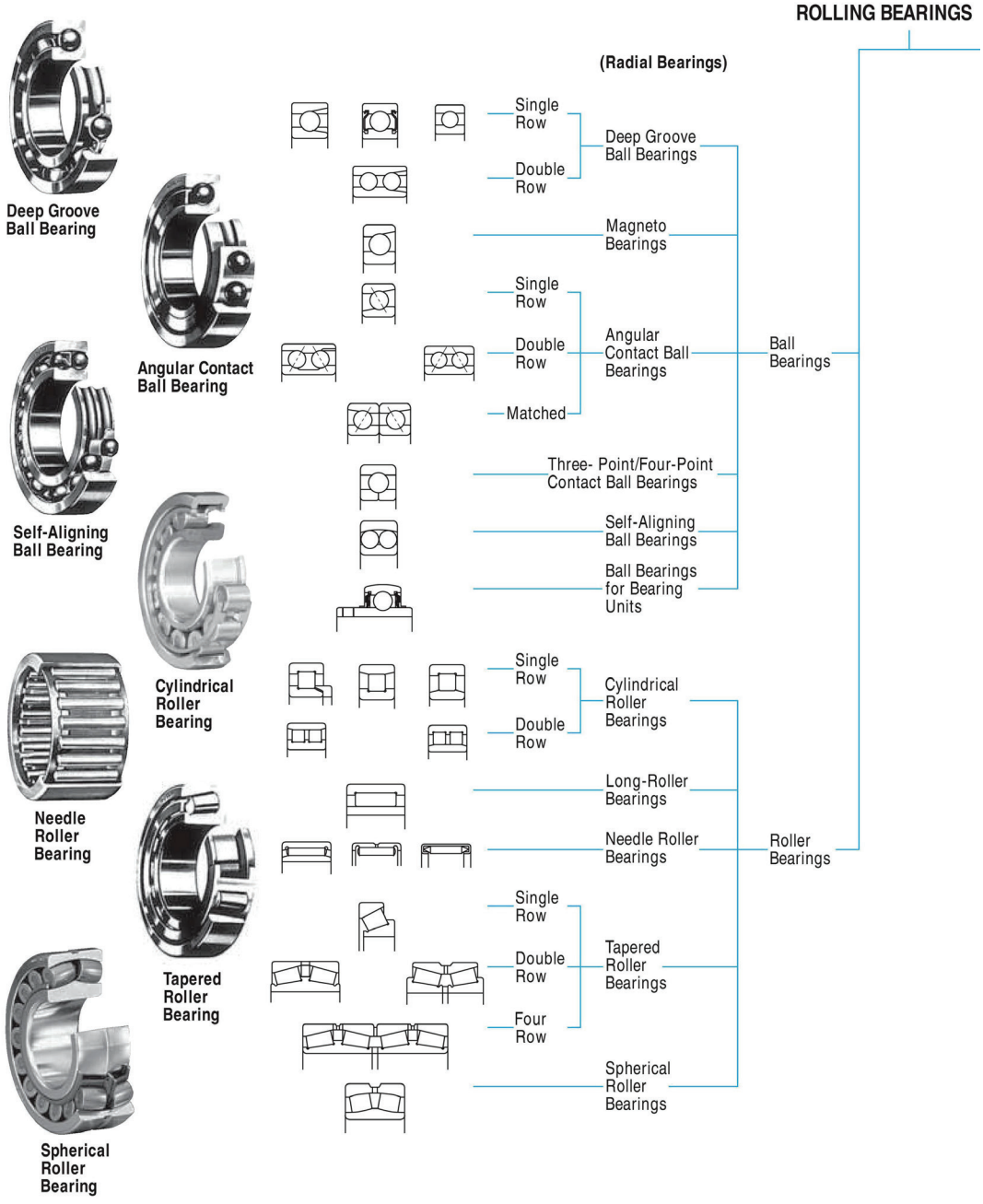
WORLDWIDE PRESENCE

With the help of wide distributor network in more than 40 countries ZNL can serve all your needs. In addition to the distributor network ZNL has a Joint Venture in Brazil to better serve its customers in the Latin American market. Apart from this ZNL also have a sales office and a distribution center in California, USA to serve the North American market as well. In its vision to grow the business further ZNL is aiming to have a local presence in German and Italian market to better serve its customers.

With all the details about our capabilities we are bringing up a catalogue which has more technical and product details by which we will be able to serve the customers to their satisfaction. We hope you will like this catalogue. We believe the customer is god and we also welcome the opinion of all our customers.

Different Types of **Bearing**

Different Types of Bearing

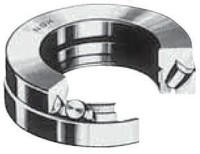


- Ball Bearings
  - Thrust Ball Bearings (Thrust Bearings)
    - Single Direction
    - Double Direction
  - Angular Contact Thrust Ball Bearings
- Roller Bearings
  - Thrust Cylindrical Roller Bearings
  - Thrust Needle Roller Bearings
  - Thrust Tapered Roller Bearings
  - Thrust Spherical Roller Bearings
- Bearings for Specific Uses
  - Automotive Clutch Release Bearings
  - Automotive Water Pump Bearings
  - Rolling Stock Axle Bearings
  - Crane-Sheave Bearings
  - Chain Conveyor Bearings
  - Others

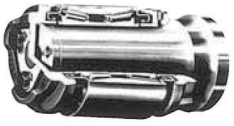
Single-Direction Thrust Ball Bearing

Thrust Cylindrical Roller Bearing

Thrust Tapered Roller Bearing



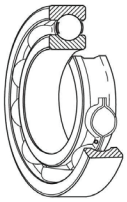
Thrust Spherical Roller Bearing



Sealed Axle Bearing

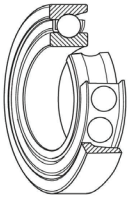
Cylindrical Roller Bearing for Sheaves

Single-Row Deep Groove Ball Bearings



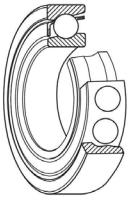
Single-row deep groove ball bearings are the most common type of rolling bearings. Their use is very widespread. The raceway grooves on both the inner and outer rings have circular arcs of slightly larger radius than that of the balls. In addition to radial loads, axial loads can be imposed in either direction. Because of their low torque, they are highly suitable for applications where high speeds and low power loss are required.
In addition to open type bearings, these bearings often have steel shields or rubber seals installed on one or both sides and are prelubricated with grease. Also, snap rings are sometimes used on the periphery. As to cages, pressed steel ones are the most common.

Magneto Bearings



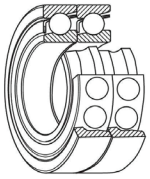
The inner groove of magneto bearings is a little shallower than that of deep groove bearings. Since the outer ring has a shoulder on only one side, the outer ring may be removed. This is often advantageous for mounting. In general, two such bearings are used in duplex pairs. Magneto bearings are small bearings with a bore diameter of 4 to 20 mm and are mainly used for small magnetos, gyroscopes, instruments, etc. Pressed brass cages are generally used.

Single-Row Angular Contact Ball Bearings



Individual bearings of this type are capable of taking radial loads and also axial loads in one direction. Four contact angles of 15°, 25°, 30°, and 40° are available. The larger the contact angle, the higher the axial load capacity. For high speed operation, however, the smaller contact angles are preferred. Usually, two bearings are used in duplex pairs, and the clearance between them must be adjusted properly.
Pressed-steel cages are commonly used, however, for high precision bearings with a contact angle less than 30°, polyamide resin cages are often used.

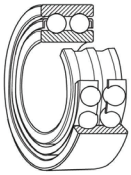
Duplex Bearings



A combination of two radial bearings is called a duplex pair. Usually, they are formed using angular contact ball bearings or tapered roller bearings. Possible combinations include face-to-face, which have the outer ring faces together (type DF), back-to-back (type DB), or both front faces in the same direction (type DT). DF and DB duplex bearings are capable of taking radial loads and axial loads in either direction. Type DT is used when there is a strong axial load in one direction and it is necessary to impose the load equally on each bearing.

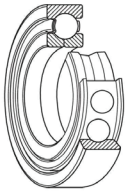
Double-Row Angular Contact Ball Bearings

Double-row angular contact ball bearings are basically two single-row angular contact ball bearings mounted back-to-back except that they have only one inner ring and one outer ring, each having raceways. They can take axial loads in either direction.



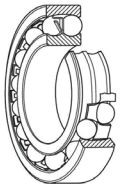
Four-Point Contact Ball Bearings

The inner and outer rings of four-point contact ball bearings are separable because the inner ring is split in a radial plane. They can take axial loads from either direction. The balls have a contact angle of 35° with each ring. Just one bearing of this type can replace a combination of face-to-face or back-to-back angular contact bearings.
Machined brass cages are generally used.



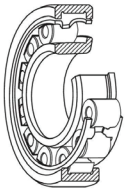
Self-Aligning Ball Bearings

The inner ring of this type of bearing has two raceways and the outer ring has a single spherical raceway with its center of curvature coincident with the bearing axis. Therefore, the axis of the inner ring, balls, and cage can deflect to some extent around the bearing center. Consequently, minor angular misalignment of the shaft and housing caused by machining or mounting error is automatically corrected.
This type of bearing often has a tapered bore for mounting using an adapter sleeve.

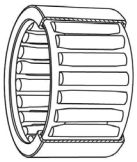


Cylindrical Roller Bearings

In bearings of this type, the cylindrical rollers are in linear contact with the raceways. They have a high radial load capacity and are suitable for high speeds.
There are different types designated NU, NJ, NUP, N, NF for single-row bearings, and NNU, NN for double-row bearings depending on the design or absence of side ribs.
The outer and inner rings of all types are separable.
Some cylindrical roller bearings have no ribs on either the inner or outer ring, so the rings can move axially relative to each other. These can be used as free-end bearings. Cylindrical roller bearings, in which either the inner or outer rings has two ribs and the other ring has one, are capable of taking some axial load in one direction. Double-row cylindrical roller bearings have high radial rigidity and are used primarily for precision machine tools.
Pressed steel or machined brass cages are generally used, but sometimes molded polyamide cages are also used.

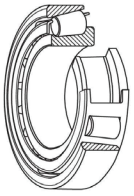


Needle Roller Bearings



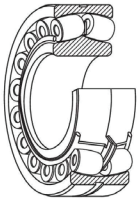
Needle roller bearings contain many slender rollers with a length 3 to 10 times their diameter. As a result, the ratio of the bearing outside diameter to the inscribed circle diameter is small, and they have a rather high radial load capacity.
There are numerous types available, and many have no inner rings. The drawn-cup type has a pressed steel outer ring and the solid type has a machined outer ring. There are also cage and roller assemblies without rings. Most bearings have pressed steel cages, but some are without cages.

Tapered Roller Bearings



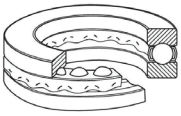
Bearings of this type use conical rollers guided by a back-face rib on the cone. These bearings are capable of taking high radial loads and also axial loads in one direction. In the HR series, the rollers are increased in both size and number giving it an even higher load capacity.
They are generally mounted in pairs in a manner similar to single-row angular contact ball bearings. In this case, the proper internal clearance can be obtained by adjusting the axial distance between the cones or cups of the two opposed bearings. Since they are separable, the cone assemblies and cups can be mounted independently.
Depending upon the contact angle, tapered roller bearings are divided into three types called the normal angle, medium angle, and steep angle. Double-row and four-row tapered roller bearings are also available. Pressed steel cages are generally used.

Spherical Roller Bearings



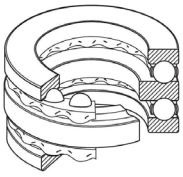
These bearings have barrel-shaped rollers between the inner ring, which has two raceways, and the outer ring which has one spherical raceway. Since the center of curvature of the outer ring raceway surface coincides with the bearing axis, they are self-aligning in a manner similar to that of self-aligning ball bearings. Therefore, if there is deflection of the shaft or housing or misalignment of their axes, it is automatically corrected so excessive force is not applied to the bearings.
Spherical roller bearings can take, not only heavy radial loads, but also some axial loads in either direction. They have excellent radial load-carrying capacity and are suitable for use where there are heavy or impact loads.
Some bearings have tapered bores and may be mounted directly on tapered shafts or cylindrical shafts using adapters or withdrawal sleeves.
Pressed steel and machined brass cages are used.

Single-Direction Thrust Ball Bearings



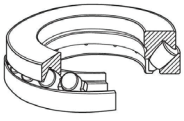
Single-direction thrust ball bearings are composed of washer-like bearing rings with raceway grooves. The ring attached to the shaft is called the shaft washer (or inner ring) while that attached to the housing is called the housing washer(or outer ring).

Double-Direction Thrust Ball Bearings



In double-direction thrust ball bearings, there are three rings with the middle one (center ring) being fixed to the shaft.
There are also thrust ball bearings with an aligning seat washer beneath the housing washer in order to compensate for shaft misalignment or mounting error.
Pressed steel cages are usually used in the smaller bearings and machined cages in the larger ones.

Spherical Thrust Roller Bearings



These bearings have a spherical raceway in the housing washer and barrel-shaped rollers obliquely arranged around it. Since the raceway in the housing washer in spherical, these bearings are self-aligning. They have a very high axial load capacity and are capable of taking moderate radial loads when an axial load is applied.
Pressed steel cages or machined brass cages are usually used.

Types of Bearing

Features \ Bearing Types	Deep Groove Ball Bearings	Magneto Bearings	Angular Contact Ball Bearings	Double-Row Angular Contact Ball Bearings	Duplex Angular Contact Ball Bearings	Four-Point Contact Ball Bearings	Self-Aligning Ball Bearings	Cylindrical Roller Bearings	Double-Row Cylindrical Roller Bearings	Cylindrical Roller Bearings with Single Rib
Load Capacity: Radial Loads	◯	○	⊙	⊙	⊙	○	◯	⊙	◎	⊙
Load Capacity: Axial Loads	↔ ◯	← ○	← ⊙	↔ ⊙	↔ ⊙	↔ ⊙	↔ ○	×	×	← ◯
Load Capacity: Combined Loads	◯	○	⊙	⊙	⊙	◯	○	×	×	◯
High Speeds	◎	⊙	◎	◯	⊙	⊙	⊙	◎	⊙	⊙
High Accuracy	◎		◎		◎	⊙		◎	◎	
Low Noise and Torque	◎							⊙		
Rigidity					⊙			⊙	◎	⊙
Angular Misalignment	⊙	○	○	○	○	○	◎	◯	○	◯
Self-Aligning Capability							☆			
Ring Separability		☆				☆		☆	☆	☆
Fixed-End Bearing	☆			☆	☆	☆	☆			
Free-End Bearing	★			★	★	★	★	☆	☆	
Tapered Bore in Inner Ring							☆		☆	
Remarks		Two bearings are usually mounted in opposition.	Contact angles of 15°, 25°, 30°, and 40°. Two bearings are usually mounted in opposition. Clearance adjustment is necessary.		Combination of DF and DT pairs is possible, but use on free-end is not possible.	Contact angle of 35°		Including N type	Including NNU type	Including NF type

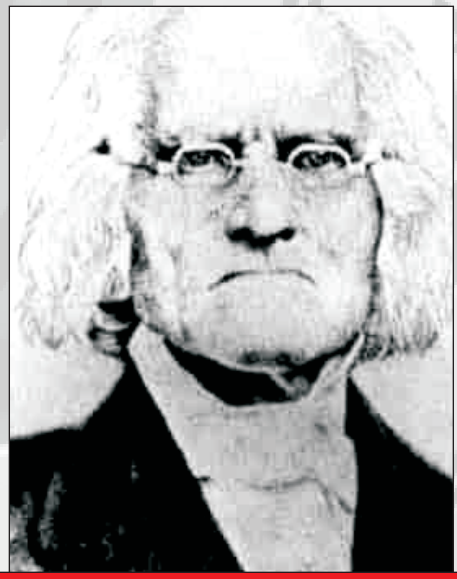
◎ Excellent ⊙ Good ◯ Fair ○ Poor × Impossible ← One direction only ↔ Two directions

☆ Applicable ★ Applicable, but it is necessary to allow shaft contraction/elongation at fitting surfaces of bearings.

Cylindrical Roller Bearings with Thrust Collars	Needle Roller Bearings	Tapered Roller Bearings	Double-and Multiple-Row Tapered Roller Bearings	Spherical Roller Bearings	Thrust Ball Bearings	Thrust Ball Bearings with Aligning Seat	Double-Direction Angular Contact Thrust Ball Bearings	Thrust Cylindrical Roller Bearings	Thrust Tapered Roller Bearings	Thrust Spherical Roller Bearings
◎	◎	◎	◎	◎	×	×	×	×	×	○
↔ ○	×	← ◎	↔ ◎	↔ ○	← ◎	← ◎	↔ ◎	← ◎	← ◎	← ◎
○	×	◎	◎	◎	×	×	×	×	×	○
◎	◎	○	○	○	×	×	○	○	○	○
		◎			◎		◎			
◎	◎	◎	◎				◎	◎	◎	
○	○	○	○	◎	×	◎	×	×	×	◎
				☆		☆				☆
☆	☆	☆	☆		☆	☆	☆	☆	☆	☆
☆			☆	☆						
	☆		★	★						
				☆						
Including NUP type		Two bearings are usually mounted in opposition. Clearance adjustment is necessary.	KH, KV types are also available but use on free-end is impossible.					Including needle roller thrust bearings		To be used with oil lubrication

◎ Excellent ○ Good ○ Fair ○ Poor × Impossible ← One direction only ↔ Two directions

☆ Applicable ★ Applicable, but it is necessary to allow shaft contraction/elongation at fitting surfaces of bearings.



" It will be hard work. It's always hard work, and hard work from everybody within the team - technical director, mechanics, drivers, engineers - everyone in the team.."

David Leslie

Selection of **Bearing Types**

- Available Space
- Loads
- Misalignment
- Speed
- Axial Displacement
- Mounting and Dismounting

Selection of Bearing Types

SELECTION OF BEARING TYPES

Allowable Bearing Space

The allowable space for a rolling bearing and its adjacent parts is generally limited so the type and size of the bearing must be selected within such limits. In most cases, the shaft diameter is fixed first by the machine design; therefore, the bearing is often selected based on its bore size. For rolling bearings, there are numerous standardized dimension series and types, and the selection of the optimum bearing from among them is necessary. The dimension series of radial bearings and corresponding bearing types.

Load Capacity and Bearing Types

The axial load carrying capacity of a bearing is closely related to the radial load capacity in a manner that depends on the bearing design. This figure makes it clear that when bearings of the same dimension series are compared, roller bearings have a higher load capacity than ball bearings and are superior if shock loads exist.

Permissible Speed and Bearing Types

The maximum speed of rolling bearings varies depending, not only the type of bearing, but also its size, type of cage, loads, lubricating method, heat dissipation, etc. Assuming the common oil bath lubrication method, the bearing types are roughly ranked from higher speed to lower

Misalignment of Inner/Outer Rings and Bearing Types

Because of deflection of a shaft caused by applied loads, dimensional error of the shaft and housing, and mounting errors, the inner and outer rings are slightly misaligned. The permissible misalignment varies depending on the bearing type and operating conditions, but usually it is a small angle less than 0.0012 radian (4').

When a large misalignment is expected, bearings having a self-aligning capability, such as self-aligning ball bearings, spherical roller bearings, and certain bearing units should be selected.

Selection of Bearing Types

Rigidity and Bearing Types

When loads are imposed on a rolling bearing, some elastic deformation occurs in the contact areas between the rolling elements and raceways. The rigidity of the bearing is determined by the ratio of bearing load to the amount of elastic deformation of the inner and outer rings and rolling elements. For the main spindles of machine tools, it is necessary to have high rigidity of the bearings together with the rest of the spindle. Consequently, since roller bearings are deformed less by load, they are more often selected than ball bearings. When extra high rigidity is required, bearings are given a preload, which means that they have a negative clearance. Angular contact ball bearings and tapered roller bearings are often preloaded.

Noise and Torque of Various Bearing Types

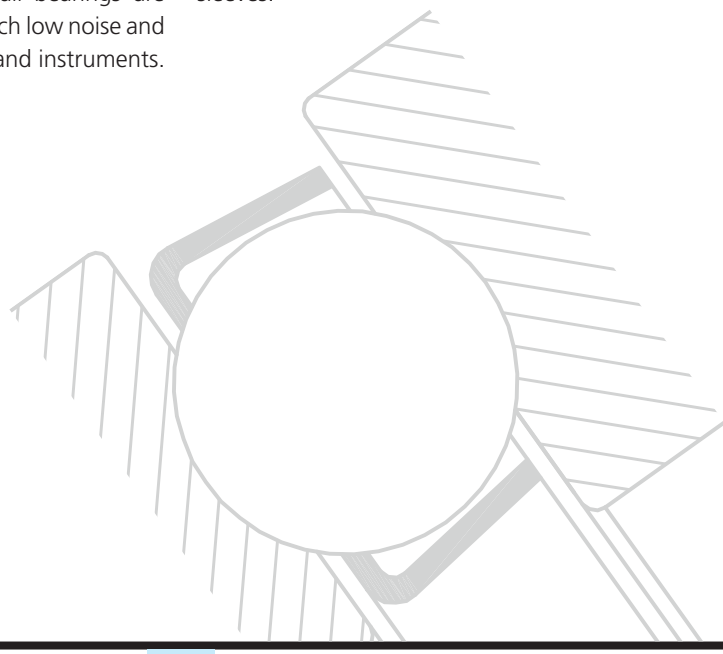
Since rolling bearings are manufactured with very high precision, noise and torque are minimal. For deep groove ball bearings and cylindrical roller bearings particularly, the noise level is sometimes specified depending on their purpose. For high precision miniature ball bearings, the starting torque is specified. Deep groove ball bearings are recommended for applications in which low noise and torque are required, such as motors and instruments.

Running Accuracy and Bearing Types

For the main spindles of machine tools that require high running accuracy or high speed applications like superchargers, high precision bearings of Class 5, 4 or 2 are usually used. The running accuracy of rolling bearings is specified in various ways, and the specified accuracy classes vary depending on the bearing type. A comparison of the inner ring radial runout for the highest running accuracy specified for each bearing type. For applications requiring high running accuracy, deep groove ball bearings, angular contact ball bearings, and cylindrical roller bearings are most suitable.

Mounting and Dismounting of Various Bearing Types

Separable types of bearings like cylindrical roller bearings, needle roller bearings and tapered roller bearings are convenient for mounting and dismounting. For machines in which bearings are mounted and dismounted rather often for periodic inspection, these types of bearings are recommended. Also, self-aligning ball bearings and spherical roller bearings (small ones) with tapered bores can be mounted and dismounted relatively easily using sleeves.



THE COMMITMENT TO QUALITY...
THE COMMITMENT TO GROWTH...
Precision Bearings Pvt. Ltd.

"Success can only come to you by courageous devotion to the task lying in front of you and there is nothing worth in this world that can come without the sweat of our brow."

Sir C.V. Raman

Selection of Bearing Size

- Load Rating & Life
- Dynamic Bearing Load
- Static Load Carrying Capacity

Selection of Bearing Size

Selection of Bearing Size

The bearing size to be used for an application can be initially selected on the basis of its load ratings in relation to the applied loads and the requirements regarding service life and reliability.

Load ratings and Life

Dynamic bearing loads and life.

The basic dynamic load rating C is used for calculations involving dynamically stressed bearings. i.e. a bearing that rotates under load. It expresses the bearing load that will given an ISO:281:1990. It is assumed that the load is constant in magnitude and direction and is radial for redial bearings and axial, centrically acting for thrust bearings.

The life of a rolling bearing is defined as

- the number of revolutions or
- the number of operating hours at a given speed

which the bearing is capable of enduring before the first sign of metal fatigue (flaking. spalling) occurs on one of its rings or rolling elements.

There are several other types of bearing life. One of these is "service life" which represents the actual life of a bearing in real operating conditions before it fails. Note that individual bearing life can only be predicted statistically.

Another "life" is the specification life". This is the life specified by an authority, for example, based on hypothetical load and speed data supplied by the same authority. It is generally a requisite L10 basic rating life and based on experience gained from similar applications.

Static bearing Loads

This basic static load rating C_0 is used in calculations when the bearings are to:

- rotate at very slow speeds (n < 10 r /min)
- Perform very slow oscillating movements
- be stationary under load for certain extended periods

Selecting bearing size using the life equations

Basic rating life

The basic rating life of a bearing according to ISO 281:1990 is

If the speed is constant, it is often preferable to calculate the life expressed in operating hours, using the equation.

$$L_{10h} = \frac{10^6}{60\,n} L_{10}$$

where

L10 = basic rating life (at 90% reliability) millions of revolutions

L10h = basic rating life (at 90% reliability) operating hours

C = basic dynamic load rating, kN

P = equivalent dynamic bearing load, kN

n = rotational speed, r/min.

p = exponent of the life equation

= 3 for ball bearings

= 10/3 for roller bearings

Life calculation with variable operating conditions

In applications where bearing load varies over time both in magnitude and direction with changes of speed, temperature, lubrication conditions and level of contamination, the bearing life cannot be calculated directly without the need of the intermediate calculation step of an equivalent load related to the variable load conditions.

Selection of Bearing Size

Influence of operating temperature

The dimensions of a bearing in operation change as a result of structural transformations within the material. Theses transformations are influenced by temperature, time and stress.

In avoid inadmissible dimensional changes in operation due to the structural transformation bearing materials are subjected to a special heat treatment (stabilization) process.

Depending on the bearing type, standard bearings made from through-hardening and induction hardening steels have a recommended maximum operating temperature, between 20 and 200 ^{0}C. These maximum operating temperature are directly related to the heat treatment process.

The satisfactory operation of bearing at leveled temperatures also depends on whether the chosen lubricant will retain its lubricating properties and whether the materials used for the seals, cages etc. are suitable.

Dynamic bearing loads

Calculation of dynamic bearing loads

The loads acting on a bearing can be calculated according to the laws of mechanics if the external forces (e.g. forces for power transmission work forces or inertia forces) are known or can be calculated. When calculating the load component for a single bearing, the staff is considered as a beam restring on rigid, moment free supports or the sake of simplification.

Equivalent dynamic bearing load:

If the calculated bearing load, F, obtained when using the above information, is found to fulfil the requirements for the basic dynamic load rating C i.e. the load is constant in magnitude and direction and acts radially on a radial bearing or axially and centrically on a thrust bearing, then P = F and the load may be inserted directly in the life equations.

In all other cases it is first necessary to calculate the equivalent dynamic bearing load. This is defined as that hypothetical load, constant in magnitude and direction, acting redially on radial bearings or axially and centrically on a thrust bearing which, if applied, would have the same influence on bearing life as the actual loads to which the bearing is subjected.

If the resultant load is constant in magnitude and direction, the equivalent dynamic bearing load P can be obtained from the general equation

$$P = X F_r + Y F_a$$

where

P	= equivalent dynamic bearing load, kN
F_r	= actual radial bearing load, kN
F_a	= actual axial bearing load, kN
X	= redial load factor for the bearing
Y	= axial load factor for the bearing

An additional axial load only influences the equivalent dynamic load P for a single raw radial bearing if the ratio Fa / Fr exceeds a certain limiting factor e. With double raw bearing even light axial loads are generally significant.

The same general equation also applies to spherical roller thrust bearings, which can accommodate both axial and radial loads for thrust bearings which can accommodate only ;purely axial loads, e.g. thrust ball bearings and cylindrical roller thrust bearings, the equation can be simplified. Provided the load acts centrically to

$$P = F_a$$

Requisite minimum load

The correlation between load and service life is less evident at very light loads. Other failure mechanisms than fatigue are determining.

Selection of Bearing Size

In order to provide satisfactory operation, ball and roller bearings must always be subjected to given minimum load. A general "rule of thumb" indicates that minimum loads corresponding to 0,02 C should be imposed on roller bearings and minimum loads corresponding to 0,01 C on ball bearings. The importance of applying a minimum load increases where accelerations in the bearing are high.

Selecting bearing size using the static load carrying capacity.

The bearing size should be selected on the basis of static load ratings C_0 instead of on bearing life when one of the following conditions exist.

- The bearing is stationary and is subjected to continuous or intermittent (shock) loads.
- The bearing makes slow oscillating or alignment movements under load
- The bearing rotates under load at very slow speed (n < 10 r/min) and is only required to have a short life.
- The bearing rotates and, in addition to the normal operating loads, has to sustain heavy shock loads.

In all these cases, the permissible load for a bearing is determined not by material fatigue but by the amount of permanent deformation to the raceway caused by the load. Loads acting on a stationery bearing. or one which is slowly oscillating, as well as shock loads on a rotating bearing, can produce flattened areas on the rolling elements and indentations in the raceways. The indentations may be irregularly spaced around the raceway, or may be evenly spaced at positions corresponding to the spacing of the rolling elements.

Permanent deformations in the bearing can lead to vibration in the bearing, noisy operation and increased friction.

The extent to which these changes are detrimental to bearing performance depends on the demands placed on the bearing in a particular application. It is therefore necessary to make sure that permanent deformations do not occur, or occur to a very limited extent only by selecting a bearing with sufficiently high static load carrying capacity. If one of the following demands has to be satisfied.

- High reliability
- Quiet running (e.g. for electric motors)
- Vibration-free operation (e.g. for machine tools)
- Constant bearing frictional moment (e.g. for measuring apparatus and test equipment)
- Low starting friction under load (e.g. for cranes)

Equivalent static bearing load

Static loads comprising radial and axial components must be converted into an equivalent static bearing load. This is defined as that hypothetical load (radial for radial bearings and axial for thrust bearings) which, if applied, would cause the same maximum rolling element load in the bearing as the actual loads to which the bearing is subjected. It is obtained from the general equation.

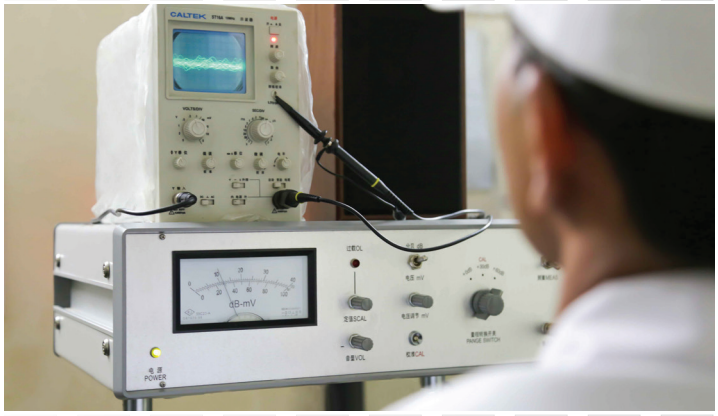
$$P_0 = X_0 F_r + Y_0 F_a$$

Where

P_0 = equivalent static bearing load, kN
F_r = actual radial bearing load, kN
F_a = actual axial bearing load, kN
X_0 = radial load factor for the bearing
Y_0 = axial load factor for the bearing

Speed and Vibration

- Reference Speed
- Influence of load and oil viscosity on reference speed/permissible speed
- Speeds above the reference speed
- Limiting Speed
- Vibration Generation in a Bearing
- Accuracy of Associated Components
- Local Damage
- Contaminants



Speed and Vibration

Speed and Vibration

There is a limit to the speed at which rolling bearings can be operated. Generally, it is the operating temperature for the lubricant being used or the material of the bearing components that sets the limit

The speed at which limiting operating temperature is reached depends on the frictional heat generated in the bearing (including any externally applied heat) and the amount of heat that can be transported away from the bearing.

Bearing type and size, internal design, load lubrication and cooling conditions as well as cage design, accuracy and internal clearance all pay a part in determining speed capability.

In the product tables generally two speeds are listed (thermal) reference speed and (kinematical) limiting speed, the value of which depending on what criteria are considered.

Reference Speed

The (thermal) reference speed listed in the product tables represent a reference value that is to be used to determine the permissible operational speed of the bearing subjected to a certain load and running with a certain lubricant viscously.

The values of the reference speed listed are in according with ISO 15312, 2003 (where trust ball bearings are excluded) This ISO standard has been established for oil lubrication, but is also valid for grease lubrication.

The reference speed for a given bearing represents the speed, under specified operating conditions, at which there is equilibrium between the heart that is generated by the bearing and the heat that is dissipated from the bearing to the shaft, housing and lubricant.

Speed and Vibration

for oil lubricated bearings

- lubricant: mineral oil without EP additives having a kinematic viscosity at 70 ^{0}C of
- Method of lubrication oil bath with the oil reaching up to the middle of the rolling element in the lowest position.

for grease lubricated bearing

- Lubricant : regular grease with a lithium thickener and a mineral base oil having a viscosity of 100 to 200 mm2/s at 40 0C (e.g. ISO VG 150)
- Grease quantity: approximately 30% of the free space in the bearing.

A temperature peak may occur during initial start-up of a grease-lubricated bearing. Therefore the bearing may have to be in operation for up to 10 to 20 hours before it reaches normal operating temperature.

Under these specific conditions the reference speed for a oil and grease - lubrication will be equal

It may be necessary to reduce the ratings in application where the outer ring rotates.

Influence of load and oil viscosity on reference speed/ permissible speed.

When load and viscosity values higher than the reference values are applied, the frictional resistance will increase so that a bearing cannot operate at the suggested reference speed, unless higher temperatures can be permitted. Lower viscosity values may result in higher operational speeds.

Speed above the reference speed

It is possible to operate bearings at speeds above the reference speed if the friction within the bearing can be reduced via a lubrication system that applies accurately measured small quantities of lubricant or by removing heat either by a circulating oil lubrication system, by cooling ribs on the housing, or by directing cooling air streams.

Any increase in speed above the reference speed without taking any of these precautions could cause bearing temperatures to rise excessively. An increase in bearing temperature means that lubricant viscosity is lowered and firm formation is made more difficult, leading to even higher friction and further temperature increase. If, at the same time, the operational clearance in the bearing is reduced because of increase inner ring temperature, the final consequence would be bearing seizure. Any increase in speed above the reference speed generally means that the temperature difference between inner and outer rings is greater than normal.

Usually, therefore, a bearing with a C3 internal clearance, which is greater than Normal, is required, and it may be necessary to look more closely at the temperature distribution in the bearing.

Limiting speeds

The limiting speed is determined by criteria that include the form stability or strength of the cage, lubrication of cage guiding surfaces, centrifugal and gyratory forces acting on the rolling elements, precision and other speed-imiting factgors, such as seals and lubricant for sealed bearings.

The limiting speeds shown in the bearing tables are valid for the bearing design and standard cage execution shown.

For grease lubrication additional aspects should be considered such as lubrication of the cage guiding surfaces and the shear strength of the lubricant, which are determined by the base oil and thickener.

Some open ball bearings have very low friction and reference speeds listed might be higher than the limiting speeds. Therefore, the permissible speed needs to be calculated and be compared the limiting speed.

It should be remembered that if bearing are to function satisfactorily, at high speeds, they must be subjected to a given minimum load.

Speed and Vibration

Low speeds

At very low speeds it is impossible for an elasto-hydrodynamic lubricant film to be built up in the contacts between the rolling elements and raceways. In these applications, lubricants containing EP addictives should generally be used.

Vibration generation in a bearing

In general a rolling bearing does not generate noise by itself. What is perceived as "bearing noise" is in fact the audible effect of the vibrations generated directly or indirectly by the bearing on the surrounding structure. This is the reason why most of the time noise problems can be considered as vibration problems involving the complete bearing application.

Accuracy of associated components

In cases where there is a tight fit between the bearing ring and the housing or the shaft, the bearing ring may take the shape of the adjacent component. If form deviations are present, these may cause vibrations during operation. It is therefore important to machine the shaft and housing seating to the required tolerances.

Local Damage

Due to mishandling or incorrect mounting, small sections on the raceways and rolling elements can be damaged. During operation, overrolling a damaged bearing component generates a specific vibration frequency.

Contaminants

If operating in contaminated conditions, dirt particles may enter the bearing and be overrolled by the rolling elements. The generated vibration level is dependent on the amount, the size and the composition of the overrolled contaminant particles. No typical frequency pattern is generated. However, an audible and disturbing noise may be created.

Formulation of **Bearing Number**

Formulation of Bearing Number

Formulation of Bearing Numbers

Bearing numbers are alphanumeric, combinations that indicate the bearing type, boundary dimensions, dimensional and running accuracies, internet clearance and other related specifications. They consist of basic numbers and supplementary symbols. The boundary dimensions of commonly used bearings mostly conform to the organizational concept of ISO.

Bearing numbers consist of a basic number and supplementary symbols. The basic number indicates the bearing series (type) and the width and diameter series.

Examples of bearing designations are shown here.

(Example 1)

6 3 0 8 ZZ C3

- Radial Clearance **C3** (Internal Clearance Symbol)
- Shields on Both Sides (Shield Symbol)
- Bearing Bore **40mm** (Bore Number)
- Diameter Series **3** } Bearing Series Symbol
- Single-Row Deep Groove Ball Bearing } Bearing Series Symbol

(Example 2)

7 2 20 A DB C3

- Axial Clearance **C3**
- Back-to-Back Arrangement
- Contact Angle **30°**
- Bearing Bore **100mm**
- Diameter Series **2**
- Single-Row Angular Contact Ball Bearing

(Example 3)

HR 3 0 2 07 J

- Small Diameter of Cup Raceway and Contact Angle Conform to ISO
- Bearing Bore **35mm**
- Diameter Series **2**
- Width Series **0**
- Tapered Roller Bearing
- High Capacity Bearing

Formulation of Bearing Number

Basic designations:

- The first figure or the first letter or combination of letters identifies the bearing type; the actual bearing type can be seen from the presentation.
- The following two figures identify the ISO Dimension Series; the first figure indicates the width or Height series (dimensions B, T or H) and the second the Diameter Series (dimension D).
- The last two figures of the basic designation give the size code of the bearing; when multiplied by 5, the bore diameter in millimeters is obtained.
  But there is no rule without some exceptions. The most important ones in the bearing designation system are listed below.

1. In a few cases the figure for the bearing type and/or the first figure of the Dimension Series, identification is omitted. These figures are given in brackets.
2. Bearing with bore diameters of 10, 12, 15, and 17 mm have the following size code identifications:
   00 = 10mm
   01 = 12mm
   02 = 15mm
   03 = 17mm
3. For some smaller bearings having bore diameter below 10mm, such as deep groove, self aligning and angular contact ball bearings,. the bore diameter is also given in millimeters (uncoded) but is not separated from the series designation by an oblique stroke.
4. Bore diameters that deviate from the standard bore diameter of a bearing have always been given uncoded, in millimeters with up to three decimal places. This bore diameter identification is part of the basic designation and is separated from the basic designation by an oblique stroke e.g. 6202/15.875 (d = 15,875mm = 5/8 in)

Series designations

The most common series designations are shown in diagram above the bearing sketches. The figures in brackets are not included in the series designation.

Supplementary Designations:

Prefixes

Prefixes are used to identify components of a bearing and are usually then followed by the designation of the complete bearing, or to avoid confusion with other bearing designations, for example they are used in front of designations for taper roller bearings according to a system described in ANSI/ABMA standard 19 for (predominantly) inch bearings.

GS Housing washer of a cylindrical roller thrust bearing
K Cylindrical roller and cage thrust assembly
K- Inner ring with roller and cage assembly (cone) or outer ring (cup) of inch taper roller bearing belonging to an ABMA standard series
L Separate inner or outer ring of a separable bearing
R Inner or outer ring with roller (and cage) assembly of a separable bearing.

Formulation of Bearing Number

W Stainless steel deep groove ball bearing
WS Shaft washer of a cylindrical roller thrust bearing
ZE Bearing with Sensor Mount feature

Suffixes

Suffixes are used to identify designs or variants which differ in some way from the original design, or which differ from the current standard design. The suffixes are divided into groups and when more than one special feature is to be identified; suffixes are provided in the order shown in the scheme.
The most commonly used suffixes are listed below. Note that not all variants are available.

A Deviating or modified internal design with the same boundary dimensions. As a rule the significance of the letter is bound to the particular bearing or bearing series. Examples 4210A: Double raw deep groove ball bearing without filling slots. 3220A: Double row angular contact ball bearing without filling slots
AC Single row angular contact ball bearing with a 25o contact angle
ADA Modified snap ring grooves in the outer ring; a two piece inner ring held together by a retaining ring
B Deviating or modified internal design with the same boundary dimensions. As a rule the significance of the letter is bound to the particular bearing series. Examples: 7224 B: Single row angular contact ball bearing with a 40o contact angle 32210 B: Step contact angle taper roller bearing
Bxx(x) B combined with a two or three-figure number identifies variants of the standard design that cannot be identified by generally applicable suffixes. Example: B20: Reduced width tolerance
C Deviating or modified internal design with the same boundary dimensions As a rule the significance of the letter is bound to the particular bearing series Example : 21306 C : Spherical roller bearing with a flangeless inner ring. Symmetrical rollers. loose guide ring and a pressed window-type steel cage.
CA (1) Spherical roller bearing of C design, but with retaining flanges on the inner ring and a machined cage.
(2) Single row angular contact ball bearing for universal matching. Two bearings arranged back-to back or face-to face will have an axial internal clearance smaller than Normal (CB) before mounting.
CAC Spherical roller bearing of the CA design but with enhanced roller guidance
CB (1) Single row angular contact ball bearing for universal matching. Two bearings arranged back-to-back or face-to-face will have a Normal axial internal clearance before mounting.
(2) Controlled axial clearance of a double row angular contact ball bearing.
CC (1) Spherical roller bearing of C design but with enhanced roller guidance.
(2) Single row angular contact ball bearing for universal matching. Two bearings arranged back-to-back or face-to-face will have an axial internal clearance larger than Normal (CB) before mounting.
CV Full complement cylindrical roller bearing with modified internal design.
CS Sheet steel reinforced contact seal of acrylonitrile-butadiene rubber (NBR) on one side of the bearing.
2CS CS contact seal on both sides of the bearing
CS2 Sheet steel reinforced contact seal of fluoro rubber (FKM) on one side of the bearing.
2CS2 CS2 contact seal on both sides of the bearing
CS5 Sheet steel reinforced contact seal of hydrogenated acrylonitrile- butadiene rubber (HNBR) on one side of the bearing

Formulation of Bearing Number

2CS5	CS5 contact seal on both sides of the bearing
C1	Bearing internal clearance smaller than C2
C2	Bearing internal clearance smaller than Normal (CN)
C3	Bearing internal clearance greater than Normal (CN)
C4	Bearing internal clearance greater than C3
C5	Bearing internal clearance greater than C4
C02	Extra reduced tolerance for running accuracy of inner ring of assembled bearing
C04	Extra reduced tolerance for running accuracy of outer ring of assembled bearing
C08	C02 + C04
C083	C02e + C04e + C3
C10	Reduced tolerance for the bore and outside diameters
D	Deviating or modified internal design with the same boundary dimensions; as a rule the significance of the letter is bound to the particular bearing series Example. 3310 D: Double row angular contact ball bearing with a two-piece inner ring
DA	Modified snap ring grooves in the outer ring ; two - piece inner ring held together by a retaining ring
DB	Two single row deep groove ball bearings (1) single row angular contact ball bearings (2) or single row taper roller bearings matched for mounting in a back-to back arrangement. The letter(s) following the DB indicate the magnitude of the axial internal clearance or preload in the bearing pair before mounting

A	Light Preload (2)
B	Moderate Preload (2)
C	Heavy Preload (2)
CA	Axial internal clearance smaller than Normal (CB) (1,2)
CB	Normal axial internal clearance (1.2)
CC	Axial internal clearance larger than Normal (CB) (1, 2)
C	Special axial internal clearance in um
GA	Light preload (1)
GB	Moderate preload (1)
G	Special preload in daN

For paired taper roller bearings the design and arrangement of the intermediate rings between the inner and outer rings are identified by a two figure number which is placed between DB and the above mentioned letters.

DF	Two single row deep groove ball bearings, single row angular contact ball bearings matched for mounting in a face to face arrangement. The letter(s) following the DF are explained under DB
DT	Two single row deep groove ball bearings, single row angular contact ball bearings or single row taper roller bearing matched for mounting in a tandem arrangement; for paired taper roller bearings the design and arrangement of the intermediate rings between the inner and/or outer rings are identified by a two figure number which follows immediately after DT.
E	Deviating or modified internal design with the same boundary dimensions; as a rule the significance of the letter is bound to the particular bearing series; usually indicates reinforced rolling element complement. Example 7212 BE: Single row angular contact ball bearing with a 400 contact angle and optimized internal

Formulation of Bearing Number

design.

EC Single row cylindrical roller bearing with an optimized internal design and with modified roller end/ flange contact.

ECA Spherical roller bearing of CA design but with reinforced rolling element complement.

ECAC Spherical roller bearing of CAC design but with reinforced rolling element complement

F Machined steel or special cast iron cage, rolling element centered; different designs or material grads are identified by a figure following the F.e.g. F1

FA Machined steel or special cast iron cage, outer ring centered'

FB Machined steel or special cast iron cage; inner ring centred

G Single row angular contact ball bearing for universal matching. Two bearing arranged back to back or face to face will have a certain axial clearance before mounting.

G Grease filling A second letter indicates the temperature range of the grease and a third letter identifies the actual grease. The significance of the second letter is as follows:

- E Extreme pressure grease
- F Food compatible grease
- H,J High temperature grease, e.g. -20 to + 130˚C
- L Low temperature grease, e.g.- 50 to + 80˚C
- M Medium temperature grease, e.g. -30 to +110˚C
- W,X Low/high temperature grease, e.g. -40 to +140˚C

A figure following three-letter grease code indicates that the filling degree deviates from the standard – Figure 1.2 and 3 indicate smaller than standard 4 up to 9 a larger fill. Examples:
GEA: Extreme pressure grease, Standard fill
GLB2 Low temperature grease, 15 to 25% fill

GA Single row angular contact ball bearing for universal matching. Two bearings arranged back to back or face to face will have a light preload before mounting.

GB Single row angular contact ball bearing for universal matching. Two bearings arranged back to back or face to face will have a moderate preload before mounting.

GC Single row angular contact ball bearing for universal matching. Two bearings arrange back to back or face to face will have a heavy preload before mounting.

J Pressed steel cage, rolling element centred, unhardened; different designs are identified by a figure e.g. J1

JR Cage comprising of two flat washers of unhardened steel, riveted together

K Tapered bore, taper 1:12

LS Contact seal of acrylonitrile butadiene rubber (NBR) of polyurethane (AU) with or without sheet steel reinforcement, on one side of the bearing.

2LS LS contact seal on both sides of the bearing

M Machined brass cage, rolling element centered; different designs or material grades are identified by a figure or a letter e.g. M2, MC

MA Machined brass cage, outer ring centered

MB Machined brass cage inner ring centered

ML Machined one piece window type brass cage inner or outer ring cetered

MP Machined one piece window type brass cage, with punched or reamed pockets inner or outer ring

Formulation of Bearing Number

	centered.
MR	Machined one piece window type brass cage, rolling element centered
MT	Grease fill for medium temperatures (e.g. -30 to +110˚C) A two figure number following MT identifies the actual grease. An additional letter or letter figure combination as mentioned under "HT" identifies filling degrees other than standard Example; (MT33, MT37F9 or MT47
N	Snap ring groove in the outer ring
NR	Snap ring groove in the outer ring with appropriate snap ring
N1	One locating slot (notch) in one outer ring side face or housing washer
N2	Two locating slot (notch) 180o apart in one outer ring side face or housing washer
P	Injection moulded cage of glass fibers reinforced polyamide 6, 6 rolling element centered
PH	Injection moulded cage of polyetheretherketone (PEEK), rolling element centered.
PHA	Injection moulded cage of polyetheretherketone (PEEK), outer ring centered.
PHAS	Injection moulded cage of polyetheretherketone (PEEK), outer ring centred, lubrication grooves in the guiding surfaces
P4	Dimensional and running accuracy to ISO tolerance class 4
P5	Dimensional and running accuracy to ISO tolerance class 5
P6	Dimensional and running accuracy to ISO tolerance class 6
P62	P6 + C2
P63	P6 + C3
Q	Optimized internal geometry and surface finish (taper roller bearing)
R	1. Integral external outer ring flange 2. Crowned runner surface (tack runner bearing)
RS	Contact seal of acrylonitrile-butadiene rubber (NBR) with or without sheet steel reinforcement on one side of the bearing
2RS	RS contact seal on both sides of the bearing
RS1	Sheet steel reinforced contact seal of acrylonitrile - butadiene rubber (NBR) on one side of the bearing
2RS1	RS1 contact seal on both sides of the bearing
RS1Z	Sheet steel reinforced contact seal of acrylonitrile-butadiene rubber (NBR) on one side and one shield on the other side of the bearing
RS2	Sheet steel reinforced contact seal of fluoro rubber (FKM) on one side of the bearing
2RS2	RS2 contact seal on both sides of the bearing.
RSH	Sheet steel reinforced contact seal of acrylonitrile-butadiene rubber (NBR) on one side of the bearing.
2RSH	RSH contact eal on both sides of the bearing.
RSL	Sheet steel reinforced low-friction contract seal of acrylonitrile-butadiene rubber (NBR) on one side of the bearing
2RSL	RSL low friction contact seal on both sides of the bearing
RZ	Sheet steel reinforced low-frictional seal of acrylonitrile-butadiene rubber (NBR) on one side of the bearing
2RZ	RZ low-friction seal on both sides of the bearing
S0	Bearing rings or washer dimensionally stabilized for use at operating temperature up to +150˚C
S1	Bearing rings or washer dimensionally stabilized for use at operating temperatures up to +200˚C
S2	Bearing rings or washers dimensionally stabilized for use at operating temperatures up to +250˚C

Formulation of Bearing Number

S3	Bearing rings or washers dimensionally stabilized for use at operating temperatures up to +300˚C
S4	Bearing rings or washers dimensionally stabilized for use at operating temperatures up to +350˚C
T	Window-type cage of fabric reinforced phenolic resin, rolling element centred
TB	Window-type cage of fabric reinforced phenolic resin, inner ring centred
TH	Snap type cage of fabric reinforced phenolic resin, rolling element centered
TN	Injection moulded cage of polyamide 6,6 rolling element centered
TNH	Injection moulded cage of polyethetherketone (PEEK) rolling element centered.
TNHA	Injection moulded cage of polyethetherketone (PEEK) outer ring centered.
TN9	Injection moulded cage of glass fiber reinforced polyamide 6, 6 rolling element centered.
U	U combined with a one-figure number identifies a taper roller bearing, cone or cup, with reduced width tolerance. Examples: U2 : width tolerance + 0.05/0 mm, U4 : width tolerance + 0.10/0 mm
V	Full complement bearing (without cage)
VH	Full complement cylindrical roller bearing with self-retaining roller set
W	Without annular groove and lubrication holes in outer ring
WT	Grease fill for low as well as high temperatures (e.g. -4- to +1600 C) WT or a two-figure number following WT identifies the actual grease. An additional letter or letter/figure combination as mentioned under "HT" identifies filling degrees other than standard. Examples WT or WTF1
W20	Three lubrication holes in the outer ring
W26	Six lubrication holes in the inner ring
W33	Annular groove and three lubrication holes in the outer ring
W33X	Annular groove and six lubrication holes in the outer ring
W513	Six lubrication holes in the inner ring and annular groove and three lubrication holes in the outer ring.
W64	Solid oil filling
W77	Plugged W33 Lubrication holes
X	1. Boundary dimensions altered to conform to ISO standards 2. Cylindrical runner surface (track runner bearing)
Y	Pressed brass cage, rolling element centered; different designs or material grades are identified by a figure following the Y.e.g. Y1
Z	Shield of pressed sheet steel o one side of the bearing
2Z	Z-shield both sides of the bearing.

B	Modified internal construction
T	Solid window cage made from hard fabric or high performance plastic
UA	Universal designs for fitting in pairs, bearings pair has small axial internal clearance in O and X arrangement
UL	Universal designs for fitting in pairs, bearings pair has slight preload in O and X arrangement
UO	Universal designs for fitting in pairs, bearings pair is clearance-free in O and X arrangement
VA301	Bearing for traction motors
VA350	Bearing for railway axleboxes
VA405	Bearing for vibratory applications
VA 406	Bearing for vibratory applications with special PTFE bore coating

Bearing Data General

- Dimentions
- Tolerances
- Bearing Internal Clearance
- Material for Rolling Bearings
- Cages

Bearing data - general

ISO General Plans

The ISO General Plans for boundary Dimensions of radial bearings contains progressive series of standardized outside diameters for every standard bore diameter arranged in diameter Series 7,8,9,0,1,2,3 and 4 (in order of increasing outside diameter).Within each Diameter Series different Width Series have also been established(Width Series 8,0,1,2,3,4,5,6 and 7 in order of increasing Width). The Width Series for radial bearings corresponds to the Height Series for thrust bearings (Height Series 7,9,1 and 2 in order of increasing Height)

By combining a Width or Height Series with a Diameter Series, a Dimension Series, designated by two figures, is arrived at. The first figure identifies the Width or Height Series and the second the Diameter Series.

In the ISO General Plans for single row metric taper roller bearings, the boundary dimensions are grouped for certain ranges of the contact angle a known as the Angle Series (Angle Series 2,3,4,5,6 and 7 in order of increasing Angle).Based on the relationship between the outside and bore diameters, and between the total bearings Width and the cross-sectional height. Diameter and Width Series have also been established. Here, a Dimension Series is obtained by combining the Angle Series with a Diameter and a Width Series. These Dimension Series consist of one figure for the Angle Series and two letters, where the first letter identifies the Diameter Series and the second the Width Series.

Tolerances

The dimensional and running accuracy of rolling bearings has been standardized internationally. In additional to the Normal tolerances, the ISO standard also cover closer tolerances, e.g.

- Tolerance class 6 which corresponds to tolerance class P6.
- Tolerance class 5 which corresponds to tolerance class P5

For special applications, such as machine tool spindle, also manufactures bearings with higher accuracy, e.g. to tolerance classes P4, P4A, PA9A, SP and UP.

Tolerance information about each bearing type is contained in the introductory texts to the various product table section under the heading “tolerance” .Bearings with higher accuracy than Normal are identified by a designation suffix for the tolerance class

Bearing data - general

Tolerance symbols

Tolerance Symbol	Definition
Bore diameter	
d	Nominal bore diameter
d_s	Single bore diameter
d_{mp}	1. Mean bore diameter, arithmetical mean of the largest and smallest single bore diameters in one plane 2. Mean diameter at the small end of a tapered bore; arithmetical mean of the largest and smallest single diameters
Δ_{ds}	Deviation of a single bore diameter from the nominal ($\Delta_{ds}=d_s-d$)
Δ_{dmp}	Deviation of the mean bore diameter from nominal ($\Delta_{dmp}=d_{mp}-d$)
V_{dp}	Bore diameter variation; difference between the largest and the smallest single bore diameter in one plane
V_{dmp}	Mean bore diameter variation; difference between largest and smallest mean bore diameter
d_1	Nominal diameter at theoretical large end of tapered bore
d_{1mp} bore	Mean diameter at theoretical large end of tapered bore; arithmetical mean of the largest and smallest single diameters
Δ_{d1mp}	Deviation of the mean bore diameter at the theoretical large end of a tapered bore from the nominal ($\Delta_{d1mp}=d_{1mp}-d_1$)
Outside diameter	
D	Nominal outside diameter
D_s	Single outside diameter
D_{mp}	Mean outside diameter; arithmetical mean of the largest and smallest single outside diameters in one plane
Δ_{Ds}	Deviation of a single outside diameter from the nominal ($\Delta_{Ds}=D_s-D$)
Δ_{Dmp}	Deviation of the mean outside diameter from the nominal ($\Delta_{Dmp}=D_{mp}-D$)
V_{Dp}	Outside diameter variation; difference between the largest and smallest single outside diameter in one plane
V_{Dmp}	Mean outside diameter variation; difference between the largest and smallest mean outside diameter
Chamfer limits	
r_s	Single chamfer dimension
$r_{s\,min}$	Smallest single chamfer dimension of r_s, r_1, r_2, r_3, r_4.....
r_1, r_3	Radial direction chamfer dimension
r_2, r_4	Axial direction chamfer dimensions

Bearing data - general

Tolerance symbols

Tolerance Symbol	Definition
Width or height	
B,C	Nominal width of inner ring and outer ring, respectively
B_s,C_s	Single width of an inner ring and outer ring, respectively
B_{1s},C_{1s}	Single width of an inner ring and outer ring, respectively, of a bearing specifically manufactured for paired mounting
Δ_{Bs}, Δ_{Cs}	Deviation of a single inner ring width or single outer ring width from the nominal ($\Delta_{Bs}=B_s-B$; $\Delta_{Cs}=C_s-C$; $\Delta_{B1s}=B_{1s}-B_1$; $\Delta_{C1s}=C_{1s}-C_1$)
V_{Bs},V_{Cs}	Ring with variation; difference between the largest and smallest single widths of an inner ring and outer ring, respectively
T	1 Nominal width (abutment width) of a taper roller bearing; distance between an inner ring(cone) back face and outer ring(cup)back face 2 Nominal height (H) of a single direction thrust bearing(except spherical thrust roller bearing T_4)
T_1	1 Nominal width of a taper roller bearing, cone assembled with a master cup 2 nominal height (H1) of a single direction thrust ball bearing seat washer
T_2	1 nominal width of tapered roller bearing, cup assembled with master cone 2 Nominal height (H) of a double direction thrust bearing
T_3	Nominal height (H1) of a double direction thrust ball bearing with a seating washers
T_4	Nominal height (H) of a spherical roller thrust bearing
Δ_{Ts}	1 Deviation the effective single width of a tapered roller bearing from nominal 2 Deviation of the height of a single direction thrust bearing from the nominal (except spherical roller thrust bearing see Δ_{T4s})
Δ_{T1s}	1 Deviation of an effective single with of a cone from the nominal 2 Deviation of the height of a single direction thrust ball bearing with a seat washer from the nominal
Δ_{T2s}	1 Deviation of the single width of a cup from nominal 2 Deviation of the height of a double direction thrust bearing from the nominal
Δ_{T3s}	Deviation of the height of the double direction thrust ball bearing with a seating washers from the nominal
Δ_{T4s}	Deviation of the height of a spherical roller thrust bearing from the nominal
Running accuracy	
K_{ia}, K_{ea}	Radial run out of an inner ring and outer ring, respectively, of an assembled bearing
S_d	Side face run-out with reference to the bore (of inner ring)
S_0	Outside inclination variation; variation in inclination of the outside cylindrical surface to the outer ring side face.
S_{ia},S_{ea}	Axial run-out of the inner ring and outer ring, respectively,of an assembled bearing
S_i,S_e	Thickness variation, measured from the middle of the race way to the back(seating)face of a shaft washer and of a housing Washer, respectively (axial run-out)

Bearing data - general

Bearing internal clearance

Bearing internal clearance is defined as the total distance through which one bearing ring can be moved relative to the other in the radial direction (radial internal clearance) or in the axial direction(axial internal clearance).

It is necessary to distinguish between initial internal clearance in the bearing prior to mounting and operating internal clearance, which applies to a bearing in operation that has reached a stable temperature.

In almost all applications, the initial clearance in a bearing is greater than its operating clearance. The difference can be attributed to the need for an interference fit on the shaft and /or in the housing, combined with thermal expansion of the bearing rings and associated components.

Sufficient internal clearance in a bearing during operation is extremely important if the bearing is to operate satisfactorily.

The initial internal clearance referred to as Normal implies that a suitable operating clearance can be obtained if the recommended shaft and housing fits are realized during mounting and operating conditions are differ from normal, for example when interference fits are used for both bearings ring or considerable temperature differences prevail, bearings with greater or smaller internal clearance than Normal are required.

Bearings having an internal clearance other than Normal are identified by the suffixes C1 to C5

For paired single row angular contact ball bearings and tapered roller bearings, double row angular contact ball bearings and four –point contact ball bearings, values for the axial internal clearance are listed instead of radial clearance, as the axial clearance is of greater importance for these bearing types.

Table

Supplementary designation for internal clearance

Suffix	Internal clearance
C1	Less than C2
C2	Less than Normal
CN	Normal, only used together with an additional letter that identifies a reduced or displaced clearance range.
C3	Greater than Normal
C4	Greater than C3
C5	Greater than C4

Materials for rolling bearings

The materials from which bearing components are made, determine, to a large extent, the performance and reliability of the bearing. For the bearing ring and rolling element, typical considerations include hardness for load carrying capacity, fatigue resistance rolling under clean or contaminated lubrication conditions, and dimensional stability of the bearing components .For the cage, considerations include friction, strain, inertial forces, and in some cases, the chemical action of certain lubricant solvents, coolants and refrigerants. The relatives importance for these considerations can be affected by other operational parameters including moisture, elevated temperatures, shock loads or combination of these and other conditions.

Contact seals integrated in rolling bearings can also have a considerable impact on the performance and reliability of the bearings.

Materials for bearing rings and rolling elements

Bearing steels for through-hardening

The most common steel for through-hardening ISO 683-17.Today, carbon chromium steel is one the oldest and most intensively investigated steels due

Bearing data - general

to the continuously increasing demands for extended bearing service life. The composition if this rolling bearing steel provides an optimum balance between manufacturing and application performance. This steel normally given a martensitic or bainitic heat treatment to obtained a hardness between 58 and 65 HRC.

Within the last few years, process developments have enabled more stringent cleanliness specification to be realized, which has had a significant impact on the consistency and quality of bearing steel. The reduction of the oxygen and harmful non-metallic inclusions has led to significantly improved properties of rolling bearing steel –the steels.

Bearing steels for case-hardening

Chromium-nickel and manganese-chromium alloyed steels according to ISO 683-17:1999 with a carbon content of approximately 0,15% are those case-hardening steels most commonly used for rolling bearings.

In applications where there are high tensile interference fits and high shock loads, bearings with carburized rings and/or rolling elements are recommended.

Cage Material

Sheet steel cages

The majority of stamped sheet steel cages are made of continuously hot rolled row carbon sheet steel in accordance with EN 10111.These light weight cages have relatively high strength and can be surface treated to further reduce friction and wear.

Stamped cages normally used in stainless steel bearings are made of stainless steel X5CrNi18-110, according to EN 10088-1.

Polymer cages

Polyamide 6,6

For the majority of injection moulded cages, polyamide 6,6 is used. This material, with glass fibre reinforcement or without, is characterized by a favourable combination of strength and elasticity. The mechanical properties like strength and elasticity of polymer materials are temperature depended and subject to ageing. The most important factors that play a role in the ageing process are temperature, time and the medium (lubricant) to which the polymer is exposed. The relationship between these factors for glass fibre reinforced PA6,6. It appears that cage life decreases with increasing temperature and the aggressiveness of the lubricant.

Therefore, whether polyamide cages are suitable for specific application depends on the operating condition and life requirements.

Towards the low operating temperature side, also a limit can be set since polyamide loses its elasticity, which can result in cage failures Cages made of glass fibre reinforced Polyamide 6,6 should for this reason not to be applied at continuous operating temperature below-40^{0}C

Bearing data - general

Cages

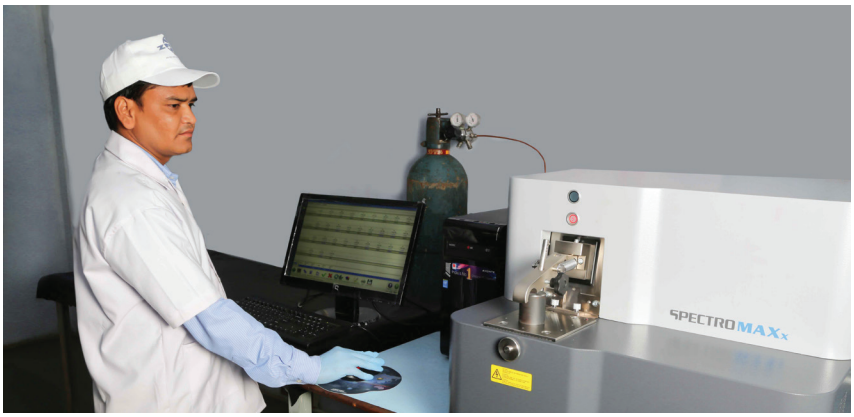
Cages have an appreciable influence on the suitability of rolling bearings. Their main purposes are

- Keeping the rolling elements at an appropriate distance from each other and to prevent direct contact between neighbouring rolling elements, in order to keep friction and thus heat generation at a minimum
- Keeping the rolling elements evenly distributed around the complete circumference to provide even load distribution and quiet and uniform running
- Guiding the rolling elements in the unloaded zone, to improve the rolling conditions in the bearing and to prevent damaging sliding movements
- Retaining the rolling elements, where bearings are of a separable design and one bearing ring is removed during mounting or dismounting.

Bearing data - general

Diameter Series (radial bearings)

Bearing type	ISO Diameter Series 7, 8, 9	0,1	2,3,4
Deep groove ball bearings[1])	617,618,619 627,628 637,638,639	60 160,161 630	2, 3 42, 43 62, 63, 64, 622, 623
Angular contact ball bearings[2])			32, 33 72, 73 QJ 2, QJ 3
Self-aligning ball bearings	139	10, 130	12, 13, 112 22, 23
Cylindrical roller bearings		NU 10, 20 NJ 10	NU 2, 3, 4, 12, 22, 23 NJ 2, 3, 4, 22, 23 NUP 2, 3, 22, 23 N 2, 3
Full complement cylindrical roller bearings	NCF 18, 19, 28, 29 NNC 48, 49 NNCF 48, 49 NNCL 48, 49	NCF 30 NNF 50 NNCF 50	NCF 22 NJG 23
Sperical roller bearings	238, 239 248, 249	230, 231 240, 241	222, 232 213, 223



Bearing data - general

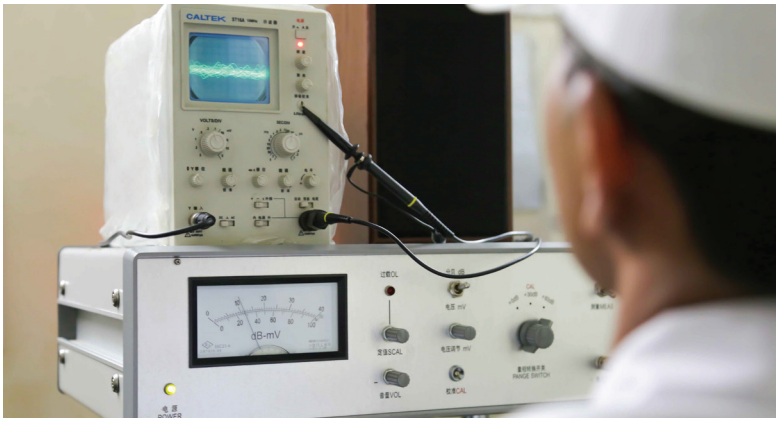
Normal tolerance for radial bearings, except tapered roller bearings

Inner ring													
d		Δ_{dmp} [1]		V_{dp}			V_{dmp}	Δ_{Bs}		Δ_{B1s}		V_{Bs}	K_{ia}
				Diameter Series 7,8,9	0,1	2,3,4							
Over	Incl.	high	low	max.	max.	max.	max.	high	low	high	low	max.	max.
mm		µm		µm			µm	µm		µm		µm	µm
-	2.5	0	-8	10	8	6	6	0	-40	-	-	12	10
2.5	10	0	-8	10	8	6	6	0	-120	0	-250	15	10
10	18	0	-8	10	8	6	6	0	-120	0	-250	20	10
18	30	0	-10	13	10	8	8	0	-120	0	-250	20	13
30	50	0	-12	15	12	9	9	0	-120	0	-250	20	15
50	80	0	-15	19	19	11	11	0	-150	0	-380	25	20
80	120	0	-20	25	25	15	15	0	-200	0	-380	25	25
120	180	0	-25	31	31	19	19	0	-250	0	-500	30	30
180	250	0	-30	38	38	23	23	0	-300	0	-500	30	40
250	315	0	-35	44	44	26	26	0	-350	0	-500	35	50
315	400	0	-40	50	50	30	30	0	-400	0	-630	40	60
400	500	0	-45	56	56	34	34	0	-450	0	-630	50	65
500	630	0	-50	63	63	38	38	0	-500	0	-800	60	70
630	800	0	-75	-	-	-	-	0	-750	-	-	70	80
800	1000	0	-100	-	-	-	-	0	-1000	-	-	80	90
1000	1250	0	-125	-	-	-	-	0	-1250	-	-	100	100
1250	1600	0	-160	-	-	-	-	0	-1600	-	-	120	120
1600	2000	0	-200	-	-	-	-	0	-2000	-	-	140	140

Bearing data - general

Outer ring										
D		Δ_{Dmp}		V_{Dp} 1)				V_{Dmp} 1)	Δ_{Cs}, Δ_{C1s}, V_{Cs}	K_{ea}
				Diameter Series 7,8,9	0,1	2,3,4	Sealed bearings 2)			
Over	Incl.	high	low	max.	max.	max.	max.	max.		max.
mm		µm		µm			µm	µm		µm
2.5	18	0	-8	10	8	6	10	6	Values are identical to	15
18	30	0	-9	12	9	7	12	7	those for the inner ring	15
30	50	0	-11	14	11	8	16	8	of the same bearing	20
50	80	0	-13	16	13	10	20	10		25
80	120	0	-15	19	19	11	26	11		35
120	150	0	-18	23	23	14	30	14		40
150	180	0	-25	31	31	19	38	19		45
180	250	0	-30	38	38	23	-	23		50
250	315	0	-35	44	44	26	-	26		60
315	400	0	-40	50	50	30	-	30		70
400	500	0	-45	56	56	34	-	34		80
500	630	0	-50	63	63	38	-	38		100
630	800	0	-75	94	94	55	-	55		120
800	1000	0	-100	125	125	75	-	75		140
1000	1250	0	-125	-	-	-	-	-		160
1250	1600	0	-160	-	-	-	-	-		190
1600	2000	0	-200	-	-	-	-	-		220
2000	2500	0	-250	-	-	-	-	-		250

1) Applies before bearing is assembled and after removal of internal and/or external snap ring, if used.
2) Applies only to bearings of Diameter series 2, 3 and 4.



Bearing data - general

Class P6 tolerances for radial bearings, except tapered roller bearings

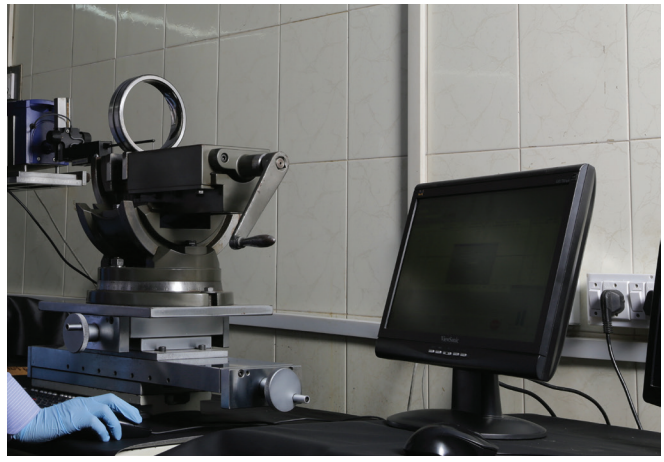
Inner ring													
d		Δ_{dmp} 1)		V_{dp}			V_{dmp}	Δ_{Bs}		Δ_{B1s}		V_{Bs}	K_{ia}
				Diameter Series 7,8,	0,1	2,3,4							
Over	Incl.	high	low	max.	max.	max.	max.	high	low	high	low	max.	max.
mm		µm		µm			µm	µm		µm		µm	µm
-	2.5	0	-7	9	7	5	5	0	-40	-	-	12	5
2.5	10	0	-7	9	7	5	5	0	-120	0	-250	15	6
10	18	0	-7	9	7	5	5	0	-120	0	-250	20	7
18	30	0	-8	10	8	6	6	0	-120	0	-250	20	8
30	50	0	-10	13	10	8	8	0	-120	0	-250	20	10
50	80	0	-12	15	15	9	9	0	-150	0	-380	25	10
80	120	0	-15	19	19	11	11	0	-200	0	-380	25	13
120	180	0	-18	23	23	14	14	0	-250	0	-500	30	18
180	250	0	-22	28	28	17	17	0	-300	0	-500	30	20
250	315	0	-25	31	31	19	19	0	-350	0	-500	35	25
315	400	0	-30	38	38	23	23	0	-400	0	-630	40	30
400	500	0	-35	44	44	26	26	0	-450	0	-630	45	35
500	630	0	-40	50	50	30	30	0	-500	0	-800	50	40
630	800	0	-50	-	-	-	-	0	-750	-	-	55	45
800	1000	0	-60	-	-	-	-	0	-1000	-	-	60	50
1000	1250	0	-75	-	-	-	-	0	-1250	-	-	70	60
1250	1600	0	-90	-	-	-	-	0	-1600	-	-	70	70
1600	2000	0	-115	-	-	-	-	0	-2000	-	-	80	80

1)Tolerances for tapered bores

Bearing data - general

Outer ring										
D		Δ_{Dmp}		V_D				V_{Dmp} [1]	Δ_{Cs}, Δ_{C1s}, V_{Cs}	K_{ea}
				Diameter Series 7,8,9	0,1	2,3,4	Sealed bearings[2]			
Over	Incl.	high	low	max.	max.	max.	max.	max.		max.
mm		µm		µm			µm	µm		µm
2.5	18	0	-7	9	7	5	9	5	Values are identical to	8
18	30	0	-8	10	8	6	10	6	those for the inner ring	9
30	50	0	-9	11	9	7	13	7	of the same bearing	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
1000	1250	0	-75	-	-	-	-	-		85
1250	1600	0	-90	-	-	-	-	-		100
1600	2000	0	-115	-	-	-	-	-		100
2000	2500	0	-135	-	-	-	-	-		120

1) Applies before bearing is assembled and after removal of internal and/or external snap ring, if used.
2) Applies only to bearings of Diameter series 0, 1, 2, 3 and 4.



Bearing data - general

ClassP5 tolerances for radial bearings, except tapered roller bearings

Inner ring														
d		Δ_{dmp}		V_{dp}		V_{dmp}	Δ_{Bs}		Δ_{B1s}		V_{Bs}	K_{ia}	S_d	S_{ia} 1)
				Diameter Series 7,8,9	0, 1, 2, 3, 4									
Over	Incl.	high	low	max.	max.	max.	high	low	high	low	max.	max.	max.	max.
mm		µm		µm		µm	µm		µm		µm	µm	µm	um
-	2.5	0	-5	5	4	3	0	-40	0	-250	5	4	7	7
2.5	10	0	-5	5	4	3	0	-40	0	-250	5	4	7	7
10	18	0	-5	5	4	3	0	-80	0	-250	5	4	7	7
18	30	0	-6	6	5	3	0	-120	0	-250	5	4	8	8
30	50	0	-8	8	6	4	0	-120	0	-250	5	5	8	8
50	80	0	-9	9	7	5	0	-150	0	-250	6	5	8	8
80	120	0	-10	10	8	5	0	-200	0	-380	7	6	9	9
120	180	0	-13	13	10	7	0	-250	0	-380	8	8	10	10
180	250	0	-15	15	12	8	0	-300	0	-500	10	10	11	13
250	315	0	-18	18	14	9	0	-350	0	-500	13	13	13	15
315	400	0	-23	23	18	1	0	-400	0	-630	15	15	15	20
400	500	0	-28	28	21	1	0	-450	0	-630	18	17	18	23
500	630	0	-35	35	26	1	0	-500	0	-800	20	19	20	25
630	800	0	-45	-	-	-	0	-750	-	-	26	22	26	30
800	1000	0	-60	-	-	-	0	-1000	-	-	32	26	32	30
1000	1250	0	-75	-	-	-	0	-1250	-	-	38	30	38	30
1250	1600	0	-90	-	-	-	0	-1600	-	-	45	35	45	30
1600	2000	0	-115	-	-	-	0	-2000	-	-	55	40	55	30

1) Applies only to deep groove and angular contact ball bearings

Bearing data - general

Outer ring											
D		Δ_{Dmp}		V_{Dp} [1]		V_{Dmp}	Δ_{Cs}, Δ_{C1s},	V_{Cs}	K_{ea}	S_D	S_{ea} [2]
				Diameter Series 7,8,9	0,1,2,3,4						
Over	Incl.	high	low	max.	max.	max.		max.	max.	max.	max.
mm		µm		µm		µm		µm	µm	µm	µm
6	18	0	-5	5	4	3	Values are identical to those for the innering of the same bearing	5	5	8	8
18	30	0	-6	6	5	3		5	6	8	8
30	50	0	-7	7	5	4		5	7	8	8
50	80	0	-9	9	7	5		6	8	8	10
80	120	0	-10	10	8	5		8	10	9	11
120	150	0	-11	11	8	6		8	11	10	13
150	180	0	-13	13	10	7		8	13	10	14
180	250	0	-15	15	11	8		10	15	11	15
250	315	0	-18	18	14	9		11	18	13	18
315	400	0	-20	20	15	10		13	20	13	20
400	500	0	-23	23	17	12		15	23	15	23
500	630	0	-28	28	21	14		18	25	18	25
630	800	0	-35	35	26	18		20	30	20	30
800	1000	0	-50	50	29	25		25	35	25	35
1000	1250	0	-63	-	-	-		30	40	30	45
1250	1600	0	-80	-	-	-		35	45	35	55
1600	2000	0	-100	-	-	-		38	55	40	55
2000	2500	0	-125	-	-	-		45	65	50	55

Bearing data - general

Normal and class CL7C tolerances for metric taper roller bearings
Inner ring, bearing width and ring widths

d		Δ_{dmp}		V_{dp}	V_{dmp}	Δ_{Bs}		K_{ia}		Δ_{Ts}		Δ_{T1s}		Δ_{T2s}	
								Tolerance classes Normal CL7C							
Over	incl.	high	low	max	max	high	low	max	max	high	low	high	low	high	low
mm		µm		µm	µm	µm		µm		um		µm		µm	
10	18	0	-12	12	9	0	-120	15	7	200	0	100	0	100	0
18	30	0	-12	12	9	0	-120	18	8	200	0	100	0	100	0
30	50	0	-12	12	9	0	-120	20	10	200	0	100	0	100	0
50	80	0	-15	15	11	0	-150	25	10	200	0	100	0	100	0
80	120	0	-20	20	15	0	-200	30	13	200	-200	100	-100	100	-100
120	180	0	-25	25	19	0	-250	35		350	-250	150	-150	200	-100
180	250	0	-30	30	23	0	-300	50		350	-250	150	-150	200	-100
250	315	0	-35	35	26	0	-350	50		350	-250	150	-150	200	-100
315	400	0	-40	40	30	0	-400	75		400	-400	200	-200	200	-200

Outer ring

D		Δ_{Dmp}		V_{Dp}	V_{Dmp}	Δ_{Cs}	K_{ea}	
							Tolerance classes	
							Normal	CL7C
over	incl.	high	low	max	max		max	max
mm		µm		µm	µm		µm	
18	30	0	-12	12	9	Values are identical	18	9
30	50	0	-14	14	11	to those for the	20	10
50	80	0	-16	16	12	inner ring of the same bearing	25	13
80	120	0	-18	18	14		35	18
120	150	0	-20	20	15		40	20
150	180	0	-25	25	19		45	23
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	-
630	800	0	-75	75	55		120	-

Bearing data - general

Class CLN tolerances for metric tapered roller bearings
Inner ring, bearing width ring widths

d		Δ_{dmp}		V_{dp}	V_{dmp}	Δ_{Bs}		Δ_{Cs}		K_{ia}	Δ_{Ts}		Δ_{T1s}		Δ_{T2s}	
over	incl.	high.	low.	max.	max	high	low	high	low	max	high	low	high	low	high	low
mm		µm		µm	µm	µm		µm		µm	µm		µm		µm	
10	18	0	-12	12	9	0	-50	0	-100	15	100	0	50	0	50	0
18	30	0	-12	12	9	0	-50	0	-100	18	100	0	50	0	50	0
30	50	0	-12	12	9	0	-50	0	-100	20	100	0	50	0	50	0
50	80	0	-15	15	11	0	-50	0	-100	25	100	0	50	0	50	0
80	120	0	-20	20	15	0	-50	0	-100	30	100	0	50	0	50	0
120	180	0	-25	25	19	0	-50	0	-100	35	150	0	50	0	100	0
180	250	0	-30	30	23	0	-50	0	-100	50	150	0	50	0	100	0
250	315	0	-35	35	26	0	-50	0	-100	60	200	0	100	0	100	0
315	400	0	-40	40	30	0	-50	0	-100	70	200	0	100	0	100	0

Outer ring

D		Δ_{Dmp}		V_{Dp}	V_{Dmp}	Kea
over	incl.	high.	low.	max.	max	max
mm		µm		µm	µm	µm
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

Bearing data - general

Class P5 toerances for metric taper roller bearings
Inner ring and bearing width

d		Δ_{dmp}		V_{dp}	V_{dmp}	Δ_{Bs}		K_{ia}	S_d	Δ_{Ts}	
over	incl.	high	low	max	max	high	low	max	max	high	low
mm		µm		µm	µm	µm		µm	µm	µm	
10	18	0	-7	5	5	0	-200	5	7	200	-200
18	30	0	-8	6	5	0	-200	5	8	200	-200
30	50	0	-10	8	5	0	-240	6	8	200	-200
50	80	0	-12	9	6	0	-300	7	8	200	-200
80	120	0	-15	11	8	0	-400	8	9	200	-200
120	180	0	-18	14	9	0	-500	11	10	350	-250
180	250	0	-22	17	11	0	-600	13	11	350	-250
250	315	0	-25	19	13	0	-700	16	13	350	-250
315	400	0	-30	23	15	0	-800	19	15	400	-400

Outer ring

D		Δ_{Dmp}		V_{Dp}	V_{Dmp}	Δ_{Cs}	K_{ea}	S_D
over	incl.	high	low	max	max		max	max
mm		µm		µm	µm		µm	µm
18	30	0	-8	6	5	Values are identical	6	8
30	50	0	-9	7	5	to those for the	7	8
50	80	0	-11	8	6	inner ring of	8	8
						the same bearing		
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
400	500	0	-33	25	17		23	15
500	630	0	-38	29	19		25	18

Bearing data - general

Tolerances for inch taper roller bearings
Inner ring

d		Δ_{ds} Tolerance classes Normal	CL2	CL3	CL0
over	incl.	high	low	high	low
mm		µm		µm	
-	76.2	13	0	13	0
76.2	101.6	25	0	13	0
101.6	266.7	25	0	13	0
266.7	304.8	25	0	13	0
304.8	609.6	51	0	25	0
609.6	914.4	76	0	38	0

Outer ring

D		Δ_{Ds} Tolerance classes Normal	CL2	CL3	CL0	K_{ia}, K_{ea}, S_{ia}, S_{ea} Tolerance classes Normal	CL2	CL3	CL0
over	incl	high	low	high	low	max	max	max	max
mm		µm		µm		µm			
-	304.8	25	0	13	0	51	38	8	4
304.8	609.6	51	0	25	0	51	38	18	9
609.6	914.4	76	0	38	0	76	51	51	26
914.4	1219.2	102	0	51	0	76	-	76	38
1219.2	-	127	0	76	0	76	-	76	-

Abutment width of single row bearing

d		D		Δ_{Ts} Tolerance classes Normal		CL2		CL3	CL0
over	incl.	over	incl	high	low	high	low	high	low
mm		mm		µm		µm		µm	
-	101.6	-	-	203	0	203	0	203	-203
101.6	266.7	-	-	356	-254	203	0	203	-203
266.7	304.8	-	-	356	-254	203	0	203	-203
304.8	609.6	-	508	381	-381	381	-381	203	-203
304.8	609.6	508	-	381	-381	381	-381	381	-381
609.6	-	-	-	381	-381	-	-	381	-381

Bearing data - general

Tolerances for thrust bearings

Nominal diameter		Shaft washer						Housing Washer			
		Tolerance classes			Toleranceclasses			Tolerances classes			
d, D		Normal, P6, P5			Normal	P6	P5	Normal, P6, P5			
		Δ_{dmp}		V_{dp}	S_i 1)	S_i 1)	S_i 1)	Δ_{Dmp}		V_{Dp}	S_e
over	incl.	high	low	max	max	max	max	high	low	max	max
mm		µm		µm	µm	µm	µm	µm		µm	
-	18	0	-8	6	10	5	3	0	-11	8	value are
18	30	0	-10	8	10	5	3	0	-13	10	identical to
30	50	0	-12	9	10	6	3	0	-16	12	those for shaft washer of same
50	80	0	-15	11	10	7	4	0	-19	14	bearing.
80	120	0	-20	15	15	8	4	0	-22	17	
120	180	0	-25	19	15	9	5	0	-25	19	
180	250	0	-30	23	20	10	5	0	-30	23	
250	315	0	-35	26	25	13	7	0	-35	26	
315	400	0	-40	30	30	15	7	0	-40	30	
400	500	0	-45	34	30	18	9	0	-45	34	
500	630	0	-50	38	35	21	11	0	-50	38	
630	800	0	-75	-	40	25	13	0	-75	55	
800	1000	0	-100	-	45	30	15	0	-100	75	
1000	1250	0	-125	-	50	35	18	0	-125	-	
1250	1600	0	-160	-	60	40	21	0	-160	-	
1600	2000	-	-	-	-	-	-	0	-200	-	
2000	2500	-	-	-	-	-	-	0	-250	-	

1) Does not apply to spherical roller thrust bearings.

Bearing data - general

Tolerances for thrust bearings

Bearing height

Tolerance classes normal P6, P5															
D		Δ_{Ts}		Δ_{T1s}		Δ_{T2s}		Δ_{T3s}		Δ_{T4s}					
										ISO					
over	incl.	high	low	high	low	high	low	high	low	high	low	high	low	high	low
mm		µm		µm		µm		µm		µm					
-	30	20	-250	100	-250	150	-400	300	-400	-	-	-	-	-	-
30	50	20	-250	100	-250	150	-400	300	-400	-	-	-	-	-	-
50	80	20	-300	100	-300	150	-500	300	-500	20	-300	0	-125	0	-100
80	120	25	-300	150	-300	200	-500	400	-500	25	-300	0	-150	0	-100
120	180	25	-400	150	-400	200	-600	400	-600	25	-400	0	-175	0	-125
180	250	30	-400	150	-400	250	-600	500	-600	30	-400	0	-200	0	-125
250	315	40	-400	-	-	-	-	-	-	40	-400	0	-225	0	-150
315	400	40	-500	-	-	-	-	-	-	40	-500	0	-300	0	-200
400	500	50	-500	-	-	-	-	-	-	50	-500	0	-420		
500	630	60	-600	-	-	-	-	-	-	60	-600	0	-500		
630	800	70	-750	-	-	-	-	-	-	70	-750	0	-630		
800	1000	80	-1000	-	-	-	-	-	-	80	-1000	0	-800		
1000	1250	-	-	-	-	-	-	-	-	100	-1400	0	-1000		
1250	1600	-	-	-	-	-	-	-	-	120	-1600	0	-1200		

Bearing data - general

Normal,P6 and p5 class tolerances for tapered bores, taper 1:12

Bore diameter		Tolerance classes Normal, P6					Tolerance classes Normal, P5				
d		Δ_{dmp}		V_{dp} 1)	$\Delta_{d1mp} - \Delta_{dmp}$		Δ_{dmp}		V_{dp} 1)	$\Delta_{d1mp} - \Delta_{dmp}$	
over	incl	high	low	max	high	low	high	low	max	high	low
mm		µm		µm	µm		µm	µm	µm	µm	
18	30	21	0	13	21	0	13	0	13	13	0
30	50	25	0	15	25	0	16	0	15	16	0
50	80	30	0	19	30	0	19	0	19	19	0
80	120	35	0	25	35	0	22	0	22	22	0
120	180	40	0	31	40	0	25	0	25	25	0
180	250	46	0	38	46	0	29	0	29	29	0
250	315	52	0	44	52	0	32	0	32	32	0
315	400	57	0	50	57	0	36	0	36	36	0
400	500	63	0	56	63	0	40	0	-	40	0
500	630	70	0	70	70	0	44	0	-	44	0
630	800	80	0	-	80	0	50	0	-	50	0
800	1000	90	0	-	90	0	56	0	-	56	0
1000	1250	105	0	-	105	0	66	0	-	66	0
1250	1600	125	0	-	125	0	78	0	-	78	0
1600	2000	150	0	-	150	0	92	0	-	92	0

1) Applies to any single radial plane of the bore

Bearing data - general

Normal tolerances for tapered bores,taper 1:30

Bore diameter		Normal tolerances				
d		Δ_{dmp}		V_{dp} 1)	$\Delta_{d1mp} - \Delta_{dmp}$	
over	incl	high	low	max	high	low
mm		µm		µm	µm	
-	80	15	0	19	30	0
80	120	20	0	22	35	0
120	180	25	0	40	40	0
180	250	30	0	46	46	0
250	315	35	0	52	52	0
315	400	40	0	57	57	0
400	500	45	0	63	63	0
500	630	50	0	70	70	0
630	800	75	0	-	100	0
800	1000	100	0	-	100	0
1000	1250	125	0	-	115	0
1250	1600	160	0	-	125	0
1600	2000	200	0	-	150	0

1) Applies to any single plane of the bore

Bearing data - general

Chamfer dimension limits for metric radial and thrust bearings, except taper roller bearings

Minimum single chamfer dimension	Nominal bearing bore diameter		Maximum chamfer dimensions		
			Radial bearings		Thrust bearings
$r_{s\,min}$ mm	d over mm	incl	$r_{1,3}$ max. mm	$r_{2,4}$ max.	$r_{1,2,3,4}$ max.
0,05	-	-	0,1	0,2	0,1
0,08	-	-	0,16	0,3	0,16
0,1	-	-	0,2	0,4	0,2
0,15	-	-	0,3	0,6	0,3
0,2	-	-	0,5	0,8	0,5
0,3	-	40	0,6	1	0,8
	40	-	0,8	1	0,8
0,6	-	40	1	2	1,5
	40	-	1,3	2	1,5
1	-	50	1,5	3	2,2
	50	-	1,9	3	2,2
1,1	-	120	2	3,5	2,7
	120	-	2,5	4	2,7
1,5	-	120	2,3	4	3,5
	120	-	3	5	3,5
2	-	80	3	4,5	4
	80	220	3,5	5	4
	220	-	3,8	6	4
2,1	-	280	4	6,5	4,5
	280	-	4,5	7	4,5
2,5	-	100	3,8	6	-
	100	280	4,5	6	-
	280	-	5	7	-
3	-	280	5	8	5,5
	280	-	5,5	8	5,5
4	-	-	6,5	9	6,5
5	-	-	8	10	8
6	-	-	10	13	10
7,5	-	-	12,5	17	12,5
9,5	-	-	15	19	15
12	-	-	18	24	18

Bearing data - general

Chamfer dimension limits for metric radial taper roller bearings

Minimum single chamfer dimension	Nominal bearing bore/outside diameter		Maximum chamfer dimensions	
$r_{s\,min}$	d, D over	incl	$r_{1,3}$ max.	$r_{2,4}$ max.
mm	mm		mm	
0,3	-	40	0,7	1,4
	40	-	0,9	1,6
0,6	-	40	1,1	1,7
	40	-	1,3	2
1	-	50	1,6	2,5
	50	-	1,9	3
1,5	-	120	2,3	3
	120	250	2,8	3,5
	250	-	3,5	4
2	-	120	2,8	4
	120	250	3,5	4,5
	250	-	4	5
2,5	-	120	3,5	5
	120	250	4	5,5
	250	-	4,5	6
3	-	120	4	5,5
	120	250	4,5	6,5
	250	400	5	7
	400	-	5,5	7,5
4	-	120	5	7
	120	250	5,5	7,5
	250	400	6	8
	400	-	6,5	8,5
5	-	180	6,5	8
	180	-	7,5	9
6	-	180	7,5	10
	180	-	9	11

Bearing data - general

Diamensions of Snap Ring Grooves and Locationg Snap Rings - (1)
Bearing of Diameter Series 18 and 19

Applicable Bearings			Snap Ring Groove								
d		D	Snap Ring Groove Diameter		Snap Ring Groove Position a				Snap Ring Groove Width b		Radius of Bottom Corners r_0
			D_1		Bearing Dimension Series						
Dimension Series					18		19				
18	19		max	min	max	min	max	min	max	min	max
–	10	22	20.8	20.5	–	–	1.05	0.9	1.05	0.8	0.2
–	12	24	22.8	22.5	–	–	1.05	0.9	1.05	0.8	0.2
–	15	28	26.7	26.4	–	–	1.3	1.15	1.2	0.95	0.25
–	17	30	28.7	28.4	–	–	1.3	1.15	1.2	0.95	0.25
20	–	32	30.7	30.4	1.3	1.15	–	–	1.2	0.95	0.25
22	–	34	32.7	32.4	1.3	1.15	–	–	1.2	0.95	0.25
25	20	37	35.7	35.4	1.3	1.15	1.7	1.55	1.2	0.95	0.25
–	22	39	37.7	37.4	–	–	1.7	1.55	1.2	0.95	0.25
28	–	40	38.7	38.4	1.3	1.15	–	–	1.2	0.95	0.25
30	25	42	40.7	40.4	1.3	1.15	1.7	1.55	1.2	0.95	0.25
32	–	44	42.7	42.4	1.3	1.15	–	–	1.2	0.95	0.25
–	28	45	43.7	43.4	–	–	1.7	1.55	1.2	0.95	0.25
35	30	47	45.7	45.4	1.3	1.15	1.7	1.55	1.2	0.95	0.25
40	32	52	50.7	50.4	1.3	1.15	1.7	1.55	1.2	0.95	0.25
–	35	55	53.7	53.4	–	–	1.7	1.55	1.2	0.95	0.25
45	–	58	56.7	56.4	1.3	1.15	–	–	1.2	0.95	0.25
–	40	62	60.7	60.3	–	–	1.7	1.55	1.2	0.95	0.25
50	–	65	63.7	63.3	1.3	1.15	–	–	1.2	0.95	0.25
–	45	68	66.7	66.3	–	–	1.7	1.55	1.2	0.95	0.25
55	50	72	70.7	70.3	1.7	1.55	1.7	1.55	1.2	0.95	0.25
60	–	78	76.2	75.8	1.7	1.55	–	–	1.6	1.3	0.4
–	55	80	77.9	77.5	–	–	2.1	1.9	1.6	1.3	0.4
65	60	85	82.9	82.5	1.7	1.55	2.1	1.9	1.6	1.3	0.4
70	65	90	87.9	87.5	1.7	1.55	2.1	1.9	1.6	1.3	0.4
75	–	95	92.9	92.5	1.7	1.55	–	–	1.6	1.3	0.4
80	70	100	97.9	97.5	1.7	1.55	2.5	2.3	1.6	1.3	0.4
–	75	105	102.6	102.1	–	–	2.5	2.3	1.6	1.3	0.4
85	80	110	107.6	107.1	2.1	1.9	2.5	2.3	1.6	1.3	0.4
90	–	115	112.6	112.1	2.1	1.9	–	–	1.6	1.3	0.4
95	85	120	117.6	117.1	2.1	1.9	3.3	3.1	1.6	1.3	0.4
100	90	125	122.6	122.1	2.1	1.9	3.3	3.1	1.6	1.3	0.4
105	95	130	127.6	127.1	2.1	1.9	3.3	3.1	1.6	1.3	0.4
110	100	140	137.6	137.1	2.5	2.3	3.3	3.1	2.2	1.9	0.6

Bearing data - general

Applicable Bearings			Snap Ring Groove								
d		D	Snap Ring Groove Diameter		Snap Ring Groove Position a				Snap Ring Groove Width b		Radius of Bottom Corners r_0
			D_1		Bearing Dimension Series						
Dimension Series					18		19				
18	19		max	min	max	min	max	min	max	min	max
–	105	145	142.6	142.1	–	–	3.3	3.1	2.2	1.9	0.6
120	110	150	147.6	147.1	2.5	2.3	3.3	3.1	2.2	1.9	0.6
130	120	165	161.8	161.3	3.3	3.1	3.7	3.5	2.2	1.9	0.6
140	–	175	171.8	171.3	3.3	3.1	–	–	2.2	1.9	0.6
–	130	180	176.8	176.3	–	–	3.7	3.5	2.2	1.9	0.6
150	140	190	186.8	186.3	3.3	3.1	3.7	3.5	2.2	1.9	0.6
160	–	200	196.8	196.3	3.3	3.1	–	–	2.2	1.9	0.6

Remarks

The minimum permissible chamfer dimensions r_N on the snap-ring-groove side of the outer rings are as follows:
Dimension series 18:For out side diameters of 78mm and less use 0.3mm chamfer.
For all others exceeding 78mm, use 0.5 mm chamfer.
Dimension series 19:For out side diameters of 24mm and less use 0.2mm chamfer.
For 47mm and less, use 0.3mm chamfer.
For all others exceeding 47mm, use 0.5mm chamfer.

Bearing data - general

Locating Snap Ring							Side Cover
Locating Snap Ring Number	Cross Sectional Height e		Thickness f		Geometry of snap ring fitted in groove (Reference)		Stepped Bore Diameter (Reference) D_x
					Slit Width g	Snap Ring Outside Diameter D_2	
	max	min	max	min	approx	max	min
NR 1022	2.0	1.85	0.7	0.6	2	24.8	25.5
NR 1024	2.0	1.85	0.7	0.6	2	26.8	27.5
NR 1028	2.05	1.9	0.85	0.75	3	30.8	31.5
NR 1030	2.05	1.9	0.85	0.75	3	32.8	33.5
NR 1032	2.05	1.9	0.85	0.75	3	34.8	35.5
NR 1034	2.05	1.9	0.85	0.75	3	36.8	37.5
NR 1037	2.05	1.9	0.85	0.75	3	39.8	40.5
NR 1039	2.05	1.9	0.85	0.75	3	41.8	42.5
NR 1040	2.05	1.9	0.85	0.75	3	42.8	43.5
NR 1042	2.05	1.9	0.85	0.75	3	44.8	45.5
NR 1044	2.05	1.9	0.85	0.75	4	46.8	47.5
NR 1045	2.05	1.9	0.85	0.75	4	47.8	48.5
NR 1047	2.05	1.9	0.85	0.75	4	49.8	50.5
NR 1052	2.05	1.9	0.85	0.75	4	54.8	55.5
NR 1055	2.05	1.9	0.85	0.75	4	57.8	58.5
NR 1058	2.05	1.9	0.85	0.75	4	60.8	61.5
NR 1062	2.05	1.9	0.85	0.75	4	64.8	65.5
NR 1065	2.05	1.9	0.85	0.75	4	67.8	68.5
NR 1068	2.05	1.9	0.85	0.75	5	70.8	72
NR 1072	2.05	1.9	0.85	0.75	5	74.8	76
NR 1078	3.25	3.1	1.12	1.02	5	82.7	84
NR 1080	3.25	3.1	1.12	1.02	5	84.4	86
NR 1085	3.25	3.1	1.12	1.02	5	89.4	91
NR 1090	3.25	3.1	1.12	1.02	5	94.4	96
NR 1095	3.25	3.1	1.12	1.02	5	99.4	101
NR 1100	3.25	3.1	1.12	1.02	5	104.4	106
NR 1105	4.04	3.89	1.12	1.02	5	110.7	112
NR 1110	4.04	3.89	1.12	1.02	5	115.7	117
NR 1115	4.04	3.89	1.12	1.02	5	120.7	122
NR 1120	4.04	3.89	1.12	1.02	7	125.7	127
NR 1125	4.04	3.89	1.12	1.02	7	130.7	132
NR 1130	4.04	3.89	1.12	1.02	7	135.7	137
NR 1140	4.04	3.89	1.7	1.6	7	145.7	147
NR 1145	4.04	3.89	1.7	1.6	7	150.7	152
NR 1150	4.04	3.89	1.7	1.6	7	155.7	157

Bearing data - general

Locating Snap Ring							Side Cover
Locating Snap Ring Number	Cross Sectional Height e		Thickness f		Geometry of snap ring fitted in groove (Reference)		Stepped Bore Diameter (Reference) D_x
					Slit Width g	Snap Ring Outside Diameter D_2	
	max	min	max	min	approx	max	min
NR 1165	4.85	4.85	1.7	1.6	7	171.5	173
NR 1175	4.85	4.85	1.7	1.6	10	181.5	183
NR 1180	4.85	4.85	1.7	1.6	10	186.5	188
NR 1190	4.85	4.85	1.7	1.6	10	196.5	198
NR 1200	4.85	4.85	1.7	1.6	10	206.5	208

Bearing data - general

Diamensions of Snap Ring Grooves and Locationg Snap Rings - (2)
Bearing of Diameter Series 0,2,3 and 4

Applicable Bearings					Snap Ring Groove								
d				D	Snap Ring Groove Diameter		Snap Ring Groove Position a				Snap Ring Groove Width b		Radius of Bottom Corners r_0
					D_1		Bearing Dimension Series						
Dimension Series							0		2, 3, 4				
0	2	3	4		max	min	max	min	max	min	max	min	max
10	–	–	–	26	24.5	24.25	1.35	1.19	–	–	1.17	0.87	0.2
12	–	–	–	28	26.5	26.25	1.35	1.19	–	–	1.17	0.87	0.2
–	10	9	8	30	28.17	27.91	–	–	2.06	1.9	1.65	1.35	0.4
15	12	–	9	32	30.15	29.9	2.06	1.9	2.06	1.9	1.65	1.35	0.4
17	15	10	–	35	33.17	32.92	2.06	1.9	2.06	1.9	1.65	1.35	0.4
–	–	12	10	37	34.77	34.52	–	–	2.06	1.9	1.65	1.35	0.4
–	17	–	–	40	38.1	37.85	–	–	2.06	1.9	1.65	1.35	0.4
20	–	15	12	42	39.75	39.5	2.06	1.9	2.06	1.9	1.65	1.35	0.4
22	–	–	–	44	41.75	41.5	2.06	1.9	–	–	1.65	1.35	0.4
25	20	17	–	47	44.6	44.35	2.06	1.9	2.46	2.31	1.65	1.35	0.4
–	22	–	–	50	47.6	47.35	–	–	2.46	2.31	1.65	1.35	0.4
28	25	20	15	52	49.73	49.48	2.06	1.9	2.46	2.31	1.65	1.35	0.4
30	–	–	–	55	52.6	52.35	2.08	1.88	–	–	1.65	1.35	0.4
–	–	22	–	56	53.6	53.35	–	–	2.46	2.31	1.65	1.35	0.4
32	28	–	–	58	55.6	55.35	2.08	1.88	2.46	2.31	1.65	1.35	0.4
35	30	25	17	62	59.61	59.11	2.08	1.88	3.28	3.07	2.2	1.9	0.6
–	32	–	–	65	62.6	62.1	–	–	3.28	3.07	2.2	1.9	0.6
40	–	28	–	68	64.82	64.31	2.49	2.29	3.28	3.07	2.2	1.9	0.6
–	35	30	20	72	68.81	68.3	–	–	3.28	3.07	2.2	1.9	0.6
45	–	32	–	75	71.83	71.32	2.49	2.29	3.28	3.07	2.2	1.9	0.6
50	40	35	25	80	76.81	76.3	2.49	2.29	3.28	3.07	2.2	1.9	0.6
–	45	–	–	85	81.81	81.31	–	–	3.28	3.07	2.2	1.9	0.6
55	50	40	30	90	86.79	86.28	2.87	2.67	3.28	3.07	3	2.7	0.6
60	–	–	–	95	91.82	91.31	2.87	2.67	–	–	3	2.7	0.6
65	55	45	35	100	96.8	96.29	2.87	2.67	3.28	3.07	3	2.7	0.6
70	60	50	40	110	106.81	106.3	2.87	2.67	3.28	3.07	3	2.7	0.6
75	–	–	–	115	111.81	111.3	2.87	2.67	–	–	3	2.7	0.6
–	65	55	45	120	115.21	114.71	–	–	4.06	3.86	3.4	3.1	0.6
80	70	–	–	125	120.22	119.71	2.87	2.67	4.06	3.86	3.4	3.1	0.6
85	75	60	50	130	125.22	124.71	2.87	2.67	4.06	3.86	3.4	3.1	0.6
90	80	65	55	140	135.23	134.72	3.71	3.45	4.9	4.65	3.4	3.1	0.6
95	–	–	–	145	140.23	139.73	3.71	3.45	–	–	3.4	3.1	0.6
100	85	70	60	150	145.24	144.73	3.71	3.45	4.9	4.65	3.4	3.1	0.6
105	90	75	65	160	155.22	154.71	3.71	3.45	4.9	4.65	3.4	3.1	0.6

Bearing data - general

Applicable Bearings					Snap Ring Groove								
d				D	Snap Ring Groove Diameter		Snap Ring Groove Position a				Snap Ring Groove Width b		Radius of Bottom Corners r_0
					D_1		Bearing Dimension Series						
Dimension Series							0		2, 3, 4				
0	2	3	4		max	min	max	min	max	min	max	min	max
110	95	80	–	170	163.65	163.14	3.71	3.45	5.69	5.44	3.8	3.5	0.6
120	100	85	70	180	173.66	173.15	3.71	3.45	5.69	5.44	3.8	3.5	0.6
–	105	90	75	190	183.64	183.13	–	–	5.69	5.44	3.8	3.5	0.6
130	110	95	80	200	193.65	193.14	5.69	5.44	5.69	5.44	3.8	3.5	0.6

Note (')

The location snap rings and snap ring grooves of these bearings are not specified by ISO.
1. The dimensions of these snap ring grooves are not applicable to bearings of diamension series 00, 82, and 83.
2. The minimum permissible chamfer dimension r_N on the snap-ring side of outer rings is 0.5mm. However, for bearings of diameter
series 0 having outside diameters 35mm and below, it is 0.3mm.

Bearing data - general

Locating Snap Ring							Side Cover
Locating Snap Ring Number	Cross Sectional Height e		Thickness f		Geometry of snap ring fitted in groove (Reference)		Stepped Bore Diameter (Reference) D_x
					Slit Width g	Snap Ring Outside Diameter D_2	
	max	min	max	min	approx	max	min
NR 26(¹)	2.06	1.91	0.84	0.74	3	28.7	29.4
NR 28(¹)	2.06	1.91	0.84	0.74	3	30.7	31.4
NR 30	3.25	3.1	1.12	1.02	3	34.7	35.5
NR 32	3.25	3.1	1.12	1.02	3	36.7	37.5
NR 35	3.25	3.1	1.12	1.02	3	39.7	40.5
NR 37	3.25	3.1	1.12	1.02	3	41.3	42
NR 40	3.25	3.1	1.12	1.02	3	44.6	45.5
NR 42	3.25	3.1	1.12	1.02	3	46.3	47
NR 44	3.25	3.1	1.12	1.02	3	48.3	49
NR 47	4.04	3.89	1.12	1.02	4	52.7	53.5
NR 50	4.04	3.89	1.12	1.02	4	55.7	56.5
NR 52	4.04	3.89	1.12	1.02	4	57.9	58.5
NR 55	4.04	3.89	1.12	1.02	4	60.7	61.5
NR 56	4.04	3.89	1.12	1.02	4	61.7	62.5
NR 58	4.04	3.89	1.12	1.02	4	63.7	64.5
NR 62	4.04	3.89	1.7	1.6	4	67.7	68.5
NR 65	4.04	3.89	1.7	1.6	4	70.7	71.5
NR 68	4.85	4.7	1.7	1.6	5	74.6	76
NR 72	4.85	4.7	1.7	1.6	5	78.6	80
NR 75	4.85	4.7	1.7	1.6	5	81.6	83
NR 80	4.85	4.7	1.7	1.6	5	86.6	88
NR 85	4.85	4.7	1.7	1.6	5	91.6	93
NR 90	4.85	4.7	2.46	2.36	5	96.5	98
NR 95	4.85	4.7	2.46	2.36	5	101.5	103
NR 100	4.85	4.7	2.46	2.36	5	106.5	108
NR 110	4.85	4.7	2.46	2.36	5	116.6	118
NR 115	4.85	4.7	2.46	2.36	5	121.6	123
NR 120	7.21	7.06	2.82	2.72	7	129.7	131.5
NR 125	7.21	7.06	2.82	2.72	7	134.7	136.5
NR 130	7.21	7.06	2.82	2.72	7	139.7	141.5
NR 140	7.21	7.06	2.82	2.72	7	149.7	152
NR 145	7.21	7.06	2.82	2.72	7	154.7	157
NR 150	7.21	7.06	2.82	2.72	7	159.7	162
NR 160	7.21	7.06	2.82	2.72	7	169.7	172
NR 170	9.6	9.45	3.1	3	10	182.9	185

Bearing data - general

Chamfer dimension limits for inch taper roller bearings

Minimum single Chamfer dimension	Inner ring Nominal bearing bore diameter		Maximum chamfer dimensions			Outer ring Nominal bearing out side diameter		Maximum chamfer dimensions	
$r_{s\,min}$		d		r_1	r_2	D		r_3	r_4
over	incl.	over	incl.	max	max	over	incl.	max	max
mm		mm		mm		mm		mm	
0.6	1.4	-	101.6	r_{1min} + 0.5	r_{2min} + 1.3	-	168.3	r_{3min} +0.6	r_{4min} +1.2
		101.6	254	r_{1min} + 0.6	r_{2min} +1.8	168.3	266.7	r_{3min} +0.8	r_{4min} +1.4
		254		r_{1min} + 0.6	r_{2min} +2	266.7	355.6	r_{3min} +1.7	r_{4min} +1.7
						355.6	-	r_{3min} +0.9	r_{4min} +2.0
1.4	2.5		101.6	r_{1min} +0.5	r_{2min} +1.3	-	168.3	r_{3min} +0.6	r_{4min} +1.2
		101.6	254	r_{1min} + 0.6	r_{2min} +1.8	168.3	266.7	r_{3min} +0.8	r_{4min} +1.4
		254		r_{1min} +2	r_{2min} +3	266.7	355.6	r_{3min} +1.7	r_{4min} +1.7
						355.6	-	r_{3min} +2	r_{4min} +3.0
2.5	4.0		101.6	r_{1min} +0.5	r_{2min} +1.3	-	168.3	r_{3min} +0.6	r_{4min} +1.2
		101.6	254	r_{1min} +0.6	r_{2min} +1.8	168.3	266.7	r_{3min} +0.8	r_{4min} +1.4
		254	400	r_{1min} +2	r_{2min} +4	266.7	355.6	r_{3min} +1.7	r_{4min} +1.7
		400		r_{1min} +2.5	r_{2min} +4.5	355.6	400	r_{3min} +2	r_{4min} +4.0
						400	-	r_{3min} +2.5	r_{4min} +4.5
4.0	5.0		101.6	r_{1min} +0.5	r_{2min} +1.3	-	168.3	r_{3min} +0.6	r_{4min} +1.2
		101.6	254	r_{1min} +0.6	r_{2min} +1.8	168.3	266.7	r_{3min} +0.8	r_{4min} +1.4
		254		r_{1min} +2.5	r_{2min} +4	266.7	355.6	r_{3min} +1.7	r_{4min} +1.7
						355.6	-	r_{3min} +2.5	r_{4min} +4.0
5.0	6.0		101.6	r_{1min} +0.5	r_{2min} +1.3	-	168.3	r_{3min} +0.6	r_{4min} +1.2
		101.6	254	r_{1min} +0.6	r_{2min} +1.8	168.3	266.7	r_{3min} +0.8	r_{4min} +1.4
		254		r_{1min} +3	r_{2min} +5	266.7	355.6	r_{3min} +1.7	r_{4min} +1.7
						355.6	-	r_{3min} +3	r_{4min} +5.0
6.0	7.5		101.6	r_{1min} +0.5	r_{2min} +1.3	-	168.3	r_{3min} +0.6	r_{4min} +1.2
		101.6	254	r_{1min} +0.6	r_{2min} +1.8	168.3	266.7	r_{3min} +0.8	r_{4min} +1.4
		254		r_{1min} +4.5	r_{2min} +6.5	266.7	355.6	r_{3min} +1.7	r_{4min} +1.7
						355.6	-	r_{3min} +4.5	r_{4min} +6.5
7.5	9.5		101.6	r_{1min} +0.5	r_{2min} +1.3	-	168.3	r_{3min} +0.6	r_{4min} +1.2
		101.6	254	r_{1min} +0.6	r_{2min} +1.8	168.3	266.7	r_{3min} +0.8	r_{4min} +1.4
		254		r_{1min} +6.5	r_{2min} +9.5	266.7	355.6	r_{3min} +1.7	r_{4min} +1.7
						355.6	-	r_{3min} +6.5	r_{4min} +9.5
9.5	12		101.6	r_{1min} +0.5	r_{2min} +1.3	-	168.3	r_{3min} +0.6	r_{4min} +1.2
		101.6	254	r_{1min} +0.6	r_{2min} +1.8	168.3	266.7	r_{3min} +0.8	r_{4min} +1.4
		254		r_{1min} +8	r_{2min} +11	266.7	355.6	r_{3min} +1.7	r_{4min} +1.7
						355.6		r_{3min} +8	r_{4min} +11.0

Application of Bearing

- Bearing Arrangements
- Radial Location of Bearings
- Axial Location of Bearings
- Bearing Preload

Application of Bearing

Bearing arrangements

The bearing arrangement of a rotating machine component, e.g. a shaft, generally requires two bearings to support and locate the component radially and axially relative to the stationary part of machine, such as a housing. Depending on the application, load, requisite running accuracy and cost considerations, the arrangement may consist of

- Locating and non-locating bearing arrangements
- Adjusted bearing arrangements
- "floating" bearing arrangements.

Bearing arrangements consisting of a single bearing that can support radial, axial and moment loads.

Locating and non-locating bearing arrangements

The locating bearing at one end of the shaft provides radial support and at the same time locates the shaft axially in both directions. It must, therefore, be fixed in position both on the shaft and in the housing. Suitable bearings are radial bearings which can accommodate combined loads, e.g. deep groove ball bearings, double row or paired single row angular contact ball bearings, self-aligning ball bearings, spherical roller bearings or matched taper roller bearings. Combinations of a radial bearing that can accommodate purely radial load, e.g. a cylindrical roller bearing having one ring without flanges, with a deep groove ball bearing, four point contact ball bearing or a double direction thrust bearing can also be used as the locating bearing. The second bearing then provides axial location in both directions but must be mounted with radial freedom in the housing.

The non-locating bearing at the other end of the shaft provides radial support only. From the large number of locating/non-locating bearing combinations the popular combinations are described in the following.

- Deep groove ball bearing/cylindrical roller bearing
- Double row angular contact ball bearing/cylindrical roller bearing
- Matched single row taper roller bearings/cylindrical roller bearing
- NUP design cylindrical roller bearing/NU design cylindrical roller bearing
- NU design cylindrical roller bearing and four point contact ball bearing/NU design cylindrical roller bearing

For the above combinations, angular misalignment of the shaft must be kept to a minimum.

Adjusted bearing arrangements

In adjusted bearing arrangements the shaft is axially located in one direction by the one bearing and in the opposite direction by the other bearing. This type of arrangement is referred to as cross located" and is generally used for short shafts. Suitable bearings include all types of radial bearings that can accommodate axial loads in at least one direction, including.

- Angular contact ball bearings
- Taper roller bearings

"Floating" bearing arrangements

Floating bearing arrangements are also cross located and are suitable where demands regarding axial location are moderate or where other components on the shaft serve to locate it axially.

Suitable bearings for this type of arrangement are

- Deep-groove ball bearings
- Self-aligning ball bearings
- Spherical roller bearings.

In these types of arrangements it is important that one ring of each bearing should be able to move on or in its seating, preferably the outer ring in the housing.

Radial location of bearings

If the load carrying ability of a bearing is to be fully utilized, its rings or washers must be fully supported around their complete circumference and across the entire width of the raceway. The support , which must be firm and even can be provided by a cylindrical or tapered seating or, for thrust bearing washers, by a flat (plane) support surface. This means that bearing seatings must be made with adequate accuracy and that their surface should be uninterrupted by grooves, holes or other features.

Generally speaking, satisfactory radial location and adequate support can only be obtained when the rings are mounted with an appropriate degree of interference. When easy mounting and dismounting are desirable, or when axial displacement is required with a non-locating bearing, an interference fit cannot always be used.

Selection of fit

When selecting a fit, the factors discussed in this section should be considered, together with the general guidelines provided.

1. Condition of rotation

Conditions of rotation refer to the bearing ring being considered in relation to the direction of the load. Essentially, there are three different conditions: "rotating load","stationary load and direction of load indeterminate".

2. Magnitude of the load

The interference fit of a bearing inner ring on its seating will be loosened with increasing load, as the ring will deform. Under the influence of rotating load the ring may begin to creep. The degree of interference must therefore be related to the magnitude of the load; the heavier the load, the greater the interference fit required. Shock loads and vibration also need to be considered.

Magnitude of load is defined as

- $P \leq 0{,}05$ C-light load
- $0{,}05\ C < P \leq 0{,}1$ C-normal load
- $0{,}1\ C < P \leq 0{,}15$ C-heavy load
- $P > 0{,}15$ C-very heavy load.

3. Bearing Internal clearance

An interference fit of a bearing on a shaft or in a housing means that the ring is elastically deformed (expanded or compressed) and that the bearing internal clearance is reduced. A certain minimum clearance should remain, how-ever. The initial clearance and permissible reduction depend on the type and size of the bearing. The reduction in clearance due to the interference fit can be so large that bearings with an initial clearance, which is greater than Normal have to be used in order to prevent the bearing from becoming preloaded.

4. Temperature conditions

In many applications the outer ring has a lower temperature in operation than the inner ring. This might lead to reduced internal clearance.

In service, bearing rings normally reach a temperature that is higher than that of the components to which they are fitted. This can result in an easing of the fit or the inner ring on its seating. White outer ring expansion may prevent the desired axial displacement of the ring in its housing.

Temperature differentials and the direction of heat flow in the bearing arrangement must therefore be carefully considered.

5. Running accuracy requirements

To reduce resilience and vibration, clearance fits should generally not be used for bearings where high demands are placed on running accuracy. Bearing seatings on the shaft and in the housing should be made to narrow dimensional tolerances, corresponding at least to grade 5 for the shaft and at least to grade 6 for the housing. Tight tolerances should also be applied to the cylindricity.

6. Design and material of shaft and housing

The fit of a bearing ring on its seating must not lead to uneven distortion of the ring (out-of-round) to provide adequate support for bearing rings mounted in thin-walled housings, light alloy housings or on hollow shafts, heavier interference fits than those normally recommended for thick-walled steel or cast iron housings or for solid shafts should be uses.

7. Ease of mounting and dismounting

Bearings with clearance fits are usually easier to mount or dismount than those with interference fits. Where operating conditions necessitate interference fits and it is essential that mounting and dismounting can be done easily, separable bearings, or bearings with a tapered bore may be used. Bearings with a tapered bore can be mounted either directly on a tapered shaft seating or via adapter or withdrawal sleeves on smooth or stepped cylindrical shafts.

Recommended fits

The tolerances for the bore and outside diameters of rolling bearings are internationally standardized.

To achieve an interference or a clearance fit for bearings with a cylindrical bore and cylindrical outside diameter, suitable tolerance ranges for the seatings on the shaft and in the housing bore are selected from the ISO tolerance system.

Only a limited number of ISO tolerance grades need be considered for rolling bearing applications. The location of the most commonly used grades relative to the bearing bore and outside diameter tolerances.

Special precautions with respect to the reduction of the internal clearance must be observed as mentioned in the sections" Self-aligning ball bearings"."CARB roller bearings".

Tables with recommendations for fits

Recommendations for bearing fits for solid steel shafts can be found in

Table 2: Radial bearings with cylindrical bore

Table 3: Thrust bearings

These recommendations for modern bearings are based on the general selection guidelines described above, developments in bearing design and years of experience for a very wide range of bearing arrangements and applications. Modern bearings can carry substantially greater loads than previous conventional bearings and recommendations reflect these more demanding conditions. The tables of housing tolerance recommendations also provide information as to whether the outer ring can be axially displaced in the housing bore. Using this information it is possible to check whether the chosen tolerance is suitable for non-separable bearings that are to be used in the non-locating position and cannot accommodate axial displacement within the bearing.

Axial location of bearings

An interference fit alone is inadequate for the axial location of a bearing ring. As a rule, therefore, some suitable means of axially securing the ring is needed.

Both rings of a locating bearing should be axially secured on both sides.

For non-locating bearings that are of a non separable

design, the ring having the thighter fit-usually the inner ring-should be axially secured; the other ring must be free to move axially with respect to its seating.

For non-locating bearings that are of a separable design, e.g. cylindrical roller bearings, both the rings are axially secured.

Method of location

Bearing with a cylindrical bore

Bearing rings having an interference fit are generally mounted so that the ring abuts a shoulder on the shaft or in the housing on one side. On the opposite side, inner rings are normally secured using lock nuts. Outer rings are usually retained by the housing end cover or possibly, in special cases, by a threaded ring.

Instead of integral shaft or housing shoulders, it is frequently more convenient to use spacer sleeves or collars between the bearing rings or between a bearing ring and an adjacent component.

The use of snap rings for the axial location of rolling bearings saves space, permits rapid mounting and dismounting, and simplifies the machining of shafts and housing bores. If moderate or heavy axial loads have to be supported an abutment collar should be inserted between the bearing ring and the snap ring, Bearings with a snap ring groove in the outer ring can be secured in a very simple and space-saving manner using a snap ring.

Bearing Preload

Depending on the application it may be necessary to have either a positive or a negative operational clearance in the bearing arrangement. In the majority of applications, the operational clearance should be positive, i.e. when in operation, the bearing should have a residual clearance

However, there are many cases, e.g. machine tool spindle bearings, pinion bearings in automotive axle drives, bearing arrangements of small electric motors, or bearing arrangements for oscillating movement, where a negative operational clearance, i.e. a preload is needed to enhance the stiffness of the bearing arrangement or to increase running accuracy. The application of a preload e.g. by springs, is also recommended where bearings are to operate without load or under very light load and at high speeds. In these cases, the preload serves to provide a minimum load on the bearing and prevent bearing damage as a result of sliding movements of the rolling elements

Types of preload

Depending on the type of bearing the preload may be either radial or axial. Cylindrical roller bearings, for example, because of their design, can only be preloaded radially, and thrust ball and cylindrical roller thrust bearings can only be preloaded axially. Single row angular contact ball bearings and taper roller bearings, which are normally subjected to axial preload, are generally mounted together with a second bearing of the same type in a back-to-back (a) or face-to-face (b) arrangement. Deep groove ball bearings are also generally preloaded axially, to do so, the bearings should have a greater radial internal clearance than Normal so that, as with angular contact ball bearings, a contact angle which is greater than zero will be produced.

For both taper roller and angular contact ball bearings, the distance L between the pressure centres is longer when the bearings are arranged back-to-back and shorter when they are arranged face-to-face the distance I between the bearing centres. This means that bearings arranged back-to-back can accommodate relatively large titing moments even if the distance between the bearing centres is relatively short. The racial forces resulting from the moment load and the deformation caused by these in the bearings are smaller than for bearings arranged face-to-face.

Application of Bearing

Effect of bearing preload

The main reasons to apply bearing preload are to

- Enhance stiffness
- Reduce running noise
- Enhance the accuracy of shaft guidance
- Compensate for wear and setting(bedding down) processes in operation
- Provide long service life

High stiffness

Bearing stiffness (in KN/μm) is defined as the ratio of the force acting on the bearing to the elastic deformation in the bearing. The elastic deformation caused by a load in preloaded bearings is smaller for a given load range than in bearings which are not preloaded.

Quiet running

The smaller the operational clearance in a bearing, the better the guidance of the rolling elements in the unloaded zone and the quieter the bearing in operation.

Accurate shaft guidance

Preloaded bearings provide more accurate shaft guidance because preload restricts the ability of the shaft to deflect under load.

Compensating for wear and setting

Wear and setting processes in a bearing arrangement during operation increase the clearance but this can be compensated for by preload.

Long service life

In certain applications preloaded bearing arrangements can enhance operational reliability and increase service life. A properly dimensioned preload can have a favourable influence on the load distribution in the bearings and therefore on service life.

Preloading by springs

By preloading bearings in small electric motors and similar applications it is possible to reduce operating noise. The bearing arrangement in this case comprises a single row deep groove ball bearing at each end of the shaft. The simplest method of applying preload is by a spring or spring "package". The spring acts on the outer ring of one the two bearings; this outer ring must be able to be axially displaced. The preload force remains practically constant even when there is axial displacement of the bearing as a result of thermal expansion. The requisite preload force can be estimated from

$F = k\ d$

Where

F = preload force, kN

K = a factor

D = bearing bore diameter, mm

Depending on the design of the electric motor, values of between 0,005 and 0,01 are used for the factor k. If preload is used primarily to protect the bearing from vibration damage when stationary, then greater preload is required and k= 0,02 should be used.

Spring loading is also a common method of applying preload to angular contact ball bearing used in high-speed grinding spindles, The method is not suitable, however, for bearing applications where a high degree of stiffness required, where the direction of load changes or where undefined shock loads can occur.

Application of Bearing

Fits for solid steel shafts
Radial bearings with cylindrical bore

Conditions[1]	Examples	Shaft diameter, mm				Tolerance
		Ball bearings[1]	Cylindrical roller bearings	Taper roller bearings	Spherical roller bearings	
Rotating inner ring load or direction of load indeterminate						
Light and	Conveyors, lightly	≤ 17	-	-	-	js5(h5)2)
variable loads	loaded gearbox	(17) to 100	≤ 25	≤ 25	-	j6(j5)2)
(P ≤ 0,05 C)	bearings	(100) to 140	(25) to 60	(25) to 60	-	k6
		-	(60) to 140	(60) to 140	-	m6
Normal to	Bearing applications	≤ 10	-	-	-	js5
heavy loads	generally,	(10) to 17	-	-	-	js(js5)2)
(P > 0,05 C)	electric motors,	(17) to 100	-	-	<25	k53)
	turbines,pumps	-	≤ 30	≤ 40	-	k6
	gearing, wood-	(100) to 140	(30) to 50		25 to 40	m5
	working machines,	(140) to 200	-	(40) to 65	-	m6
	wind mills	-	(50) to 65	-	(40) to 60	n5(4)
		(200) to 500	(65) to 100	(65) to 200	(60) to 100	n6(4)
		>500	(100) to 280	(200) to 360	(100) to 200	p6(5)
		-	-	-	-	p7(4)
		-	(280) to 500	(360) to 500	(200) to 500	r6(4)
			>500	>500	>500	r7(4)
Heavy to very	Axleboxes for heavy	-	(50) to 65	-	(50) to 70	n5(4)
heavy loads and	railway vehicles,	-	(65) to 85	(50) to 110	-	n6(4)
shock loads	traction motors,	-	(85) to 140	(110) to 200	(70) to 140	p6(6)
with difficult	rolling mills	-	(140) to 300	(200) to 500	(140) to 280	r6(7)
working conditions		-	(300) to 500	-	(280) to 400	s6min+ IT6/2[6)8)]
(P > 0,1 C)		-	>500	>500	>400	S7min+ IT7/2[6)8)]
High demands on	Machine tools	8 to 240	-	-	-	js4
running accuraacy		-	25 to 40	25 to 40	-	js4(j5)9)
with light loads		-	(40) to 140	(40) to 140	-	k4(k5)9)
(P ≤ 0,05 C)		-	(140) to 200	(140) to 200	-	m5
		-	(200) to 500	(200) to 500	-	n5
Stationary inner ring load						
Easy axial displacement of inner ring on shaft desirable	Wheels on non-rotating axles					g6(10)
Easy axial displacement of inner ring on shaft unnecessary	Tension pulleys, rope sheaves					h6
Axial loads only						

Application of Bearing

Conditions[1]	Examples	Shaft diameter, mm				Tolerance
		Ball bearings[1]	Cylindrical roller bearings	Taper roller bearings	Spherical roller bearings	
Rotating inner ring load or direction of load indeterminate						
	Bearing applications	≤ 250	-	≤ 250	≤ 250	j6
	of all kinds	>250	-	>250	>250	js6

1 > For normally to heavily loaded ball bearings (P > 0,05 C), radial clearance greater than Normal is often needed when the shaft tolerances in the table above are used, Sometimes the working conditions require tighter fits to prevent ball bearing inner rings from turning (creeping) on the shaft. If proper clearance, mostly larger than Normal clearance is selected, the tolerances below can then be used

* k4 for shaft diameters 10 to 17 mm
* n6 for shaft diameters (140) to 300 mm
* k5 for shaft diameters (17) to 25 mm
* p6 for shaft diameters (300) to 500 mm
* m5 for shaft diameter (25) to 140 mm

For additional information please contact the application engineering service.

2 > The tolerance in brackets applies to stainless steel bearings

3 > For stainless steel bearings within the diameter range 17 to 30 mm , tolerance j5 applies.

4 > Bearings with radial internal clearance greater than Normal may be necessary

5 > Bearings with radial internal clearance greater than Normal are recommended for d ≤ 150 mm, For d > 150 mm bearings with radial internal clearance greater than Normal may be necessary

6 > Bearings with radial internal clearance greater than Normal are recommended

7 > Bearings with radial internal clearance greater than Normal may be necessary. For cylindrical roller bearings radial internal clearance greater than Normal is recommended

> The tolerance in brackets apply to taper roller bearings. For lightly loaded taper roller bearings adjusted via the inner ring.

js5 or js6 should be

10 > Tolerance F6 can be protected for large bearings to provide easy displacement.

Application of Bearing

Fits for solid steel shafts
Thrust bearings

Conditions	Shaft diameter, mm	Tolerance
Axial load only		
Thrust ball bearings	-	h6
Cylindrical roller thrust bearings	-	h6 (h8)
Cylindrical roller and cage thrust assemblies	-	h8
Combined radial and axial loads acting on spherical roller thrust bearings.		
Stationary load on shaft washer	≤ 250	j6
	> 250	js6
Rotating load on shaft washer	≤ 200	k6
or direction of load indeterminate	(200) to 400	m6
	> 400	n6

Fits for cast iron and steel housings
Radial bearings-non-split housings

Condition[1)]	Examples	Tolerance[1)]	Displacement of outer ring
Rotating outer ring load			
Heavy loads on bearings in thin-walled housings, heavy shock loads (P > 0,1 C)	Roller bearing wheel hubs, big-end bearings	P7	Cannot be displaced
Normal to heavy loads (P > 0,05 C)	Ball bearing wheel hubs, big-end bearings, crane travelling wheels	N7	Cannot be displaced
Light and variable loads (P ≤ 0,05 C)	Conveyor rollers, rope sheaves, belt tensioner pulleys	M7	Cannot be displaced
Direction of load indeterminate			
Heavy shock loads	Electric tranction motors	M7	Cannot be displaced
Normal to heavy loads, (P > 0,05 C) axial displacement of outer ring unncessary	Electric motors, pumps, crankshaft bearings	K7	Cannot be displaced as a rule
Accurate or quiet running[2)]			
Ball bearings	Small electric motors	J6[3)]	Cannot be displaced
Taper roller bearings	When adjusted via the outer ring	JS5	-
	Axially located outer ring	K5	-
	Rotating outer ring load	M5	-

1 > For ball bearings with D < 100 mm, tolerance grade IT6 is often preferable and is recommend for bearings with thin-walled rings, e.g. in the 7, 8 or 9 Diameter Series. For these series, cylindricity tolerances IT4 are also recommended

2 > For high-precision bearings to tolerance class PS or better, other recommendations apply

3 > When easy displacement is required use H6 instead of J6

Application of Bearing

Fits for cast iron and steel housings
Thrust bearings

Conditions	Tolerance	Remarks
Axial load only		
Thrust ball bearings	H8	For less accurate bearing arrangements there can be a radial clearance of up to 0,001 D
Cylindrical roller thrust bearings	H7 (H9)	
Cylindrical roller and cage thrust assemblies	H10	
Spherical roller thrust bearings where separate bearings provide radial location Combined radial and axial loads on spherical roller thrust bearings.	-	Housing washer must be fitted with adequate radial clearance so that no radial load whatsoever can act on the thrust bearings
Stationary load on housing washer	H7	See also Design of associated components in section "Spherical roller thrust bearings"
Rotating load on housing washer	M7	

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Normal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		e7		f5		f6		g5		g6	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
1	3	-8	0	-14	-24	-6	-10	-6	-12	-2	-6	-2	-8
				-6	-24	2	-10	2	-12	6	-6	6	-8
				-8	-22	1	-9	0	-10	5	-5	4	-6
3	6	-8	0	-20	-32	-10	-15	-10	-18	-4	-9	-4	-12
				-12	-32	-2	-15	-2	-18	4	-9	4	-12
				-14	-30	-3	-14	-4	-16	3	-8	2	-10
6	10	-8	0	-25	-40	-13	-19	-13	-22	-5	-11	-5	-14
				-17	-40	-5	-19	-5	-22	3	-11	3	-14
				-20	-37	-7	-17	-7	-20	1	-9	1	-12
10	18	-8	0	-32	-50	-16	-24	-16	-27	-6	-14	-6	-17
				-24	-50	-8	-24	-8	-27	2	-14	2	-17
				-27	-47	-10	-22	-10	-25	0	-12	0	-15
18	30	-10	0	-40	-61	-20	-29	-20	-33	-7	-16	-7	-20
				-30	-61	-10	-29	-10	-33	3	-16	3	-20
				-33	-58	-12	-27	-13	-30	1	-14	0	-17
30	50	-12	0	-50	-75	-25	-36	-25	-41	-9	-20	-9	-25
				-38	-75	-13	-36	-13	-41	3	-20	3	-25
				-42	-71	-16	-33	-17	-37	0	-17	-1	-21
50	80	-15	0	-60	-90	-30	-43	-30	-49	-10	-23	-10	-29
				-45	-90	-15	-43	-15	-49	5	-23	5	-29
				-50	-85	-19	-39	-19	-45	1	-19	1	-25
80	120	-20	0	-72	-107	-36	-51	-36	-58	-12	-27	-12	-34
				-52	-107	-16	-51	-16	-58	8	-27	8	-34
				-59	-100	-21	-46	-22	-52	3	-22	2	-28
120	180	-25	0	-85	-125	-43	-61	-43	-68	-14	-32	-14	-39
				-60	-125	-18	-61	-18	-68	11	-32	11	-39
				-68	-117	-24	-55	-25	-61	5	-26	4	-32
180	250	-30	0	-100	-146	-50	-70	-50	-79	-15	-35	-15	-44
				-70	-146	-20	-70	-20	-79	15	-35	15	-44
				-80	-136	-26	-64	-28	-71	9	-29	7	-36
250	315	-35	0	-110	-162	-56	-79	-56	-88	-17	-40	-17	-49
				-75	-162	-21	-79	-21	-88	18	-40	18	-49
				-87	-150	-29	-71	-30	-79	10	-32	9	-40

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Normal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		e7		f5		f6		g5		g6	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
315	400	-40	0	-125	-182	-62	-87	-62	-98	-18	-43	-18	-54
				-85	-182	-22	-87	-22	-98	22	-43	22	-54
				-98	-169	-30	-79	-33	-87	14	-35	11	-43
400	500	-45	0	-135	-198	-68	-95	-68	-108	-20	-47	-20	-60
				-90	-198	-23	-95	-23	-108	25	-47	25	-60
				-105	-183	-32	-86	-36	-96	16	-38	13	-48
500	630	-50	0	-145	-215	-76	-104	-76	-120	-22	-50	-22	-66
				-95	-215	-26	-104	-26	-120	28	-50	28	-66
				-111	-199	-36	-94	-39	-107	18	-40	15	-53
630	800	-75	0	-160	-240	-80	-112	-80	-130	-24	-56	-24	-74
				-85	-240	-5	-112	-5	-130	51	-56	51	-74
				-107	-218	-17	-100	-22	-113	39	-44	34	-57
800	1000	-100	0	-170	-260	-86	-122	-86	-142	-26	-62	-26	-82
				-70	-260	14	-122	14	-142	74	-62	74	-82
				-97	-233	0	-108	-6	-122	60	-48	54	-62
1000	1250	-125	0	-195	-300	-98	-140	-98	-164	-28	-70	-28	-94
				-70	-300	27	-140	27	-164	97	-70	97	-94
				-103	-267	10	-123	3	-140	80	-53	73	-70
1250	1600	-160	0	-220	-345	-110	-160	-110	-188	-30	-80	-30	-108
				-60	-345	50	-160	50	-188	130	-80	130	-108
				-100	-305	29	-139	20	-158	109	-59	100	-78
1600	2000	-200	0	-240	-390	-120	-180	-120	-212	-32	-92	-32	-124
				-40	-390	80	-180	80	-212	168	-92	168	-124
				-90	-340	55	-155	45	-177	143	-67	-133	-89

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		h5		h6		h8		h9		j5	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
1	3	-8	0	0	-4	0	-6	0	-14	0	-25	2	-2
				8	-4	8	-6	8	-14	8	-25	10	-2
				7	-3	6	-4	6	-12	5	-22	-9	-1
3	6	-8	0	0	-5	0	-8	0	-18	0	-30	3	-2
				8	-5	8	-8	8	-18	8	-30	11	-2
				7	-4	6	-6	5	-15	5	-27	10	-1
6	10	-8	0	0	6	0	-9	0	-22	0	-36	4	-2
				8	-6	8	-9	8	-22	8	-36	12	-2
				6	-4	6	-7	5	-19	5	-33	10	0
10	18	-8	0	0	-8	0	-11	0	-27	0	-43	5	-3
				8	-8	8	-11	8	-27	8	-43	13	-3
				6	-6	6	-9	5	-24	5	-40	11	-1
18	30	-10	0	0	-9	0	-13	0	-33	0	-52	5	-4
				10	-9	10	-13	10	-33	10	-52	15	-4
				8	-7	7	-10	6	-29	6	-48	13	-2
30	50	-12	0	0	-11	0	-16	0	-39	0	-62	6	-5
				12	-11	12	-16	12	-39	12	-62	18	-5
				9	-8	8	-12	7	-34	7	-57	15	-2
50	80	-15	0	0	-13	0	-19	0	-46	0	-74	6	-7
				15	-13	15	-19	15	-46	15	-74	21	-7
				11	-9	11	-15	9	-40	9	-68	17	-3
80	120	-20	0	0	-15	0	-22	0	-54	0	-87	6	-9
				20	-15	20	-22	20	-54	20	-87	26	-9
				15	-10	14	-16	12	-46	12	-79	21	-4
120	180	-25	0	0	-18	0	-25	0	-63	0	-100	7	-11
				25	-18	25	-25	25	-63	25	-100	32	-11
				19	-12	18	-18	15	-53	15	-90	26	-5
180	250	-30	0	0	-20	0	-29	0	-72	0	-115	7	-13
				30	-20	30	-29	30	-72	30	-115	37	-13
				24	-14	22	-21	18	-60	17	-102	31	-7
250	315	-35	0	0	-23	0	-32	0	-81	0	-130	7	-16
				35	-23	35	-32	35	-81	35	-130	42	-16
				27	-15	26	-23	22	-68	20	-115	34	-8

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		h5		h6		h8		h9		j5	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
315	400	-40	0	0	-25	0	-36	0	-89	0	-140	7	-18
				40	-25	40	-36	40	-89	40	-140	47	-18
				32	-17	29	-25	25	-74	23	-123	39	-10
400	500	-45	0	0	-27	0	-40	0	-97	0	-155	7	-20
				45	-27	45	-40	45	-97	45	-155	52	-20
				36	-18	33	-28	28	-80	26	-136	43	-11
500	630	-50	0	0	-28	0	-44	0	-110	0	-175	-	-
				50	-28	50	-44	50	-110	50	-175	-	-
				40	-18	37	-31	31	-91	29	-154	-	-
630	800	-75	0	0	-32	0	-50	0	-125	0	-200	-	-
				75	-32	75	-50	75	-125	75	-200	-	-
				63	-20	58	-33	48	-98	45	-170	-	-
800	1000	-100	0	0	-36	0	-56	0	-140	0	-230	-	-
				100	-36	100	-56	100	-140	100	-230	-	-
				86	-22	80	-36	67	-107	61	-191	-	-
1000	1250	-125	0	0	-42	0	-66	0	-165	0	-260	-	-
				125	-42	125	-66	125	-165	125	-260	-	-
				108	-25	101	-42	84	-124	77	-212	-	-
1250	1600	-160	0	0	-50	0	-78	0	-195	0	-310	-	-
				160	-50	160	-78	160	-195	160	-310	-	-
				139	-29	130	-48	109	-144	100	-250	-	-
1600	2000	-200	0	0	-60	0	-92	0	-230	0	-370	-	-
				200	-60	200	-92	200	-230	200	-370	-	-
				175	-35	165	-57	138	168	126	-296	-	-

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		n6		p6		p7		r6		r7	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
80	100	-20	0	45	23	59	37	72	37	73	51	86	51
				65	23	79	37	92	37	93	51	106	51
				59	29	73	43	85	44	87	57	99	58
100	120	-20	0	45	23	59	37	72	37	76	54	89	54
				65	23	79	37	92	37	96	54	109	54
				59	29	73	43	85	44	90	60	102	61
120	140	-25	0	52	27	68	43	83	43	88	63	103	63
				77	27	93	43	108	43	113	63	128	63
				70	34	86	50	100	51	106	70	120	71
140	160	-25	0	52	27	68	43	83	43	90	65	105	65
				77	27	93	43	108	43	115	65	130	65
				70	34	86	50	100	51	108	72	122	73
160	180	-25	0	52	27	68	43	83	43	93	68	108	68
				77	27	93	43	108	43	118	68	133	68
				70	34	86	50	100	51	111	75	125	76
180	200	-30	0	60	31	79	50	96	50	106	77	123	77
				90	31	109	50	126	50	136	77	153	77
				82	39	101	58	116	60	128	85	143	87
200	225	-30	0	60	31	79	50	96	50	109	80	126	80
				90	31	109	50	126	50	139	80	156	80
				82	39	101	58	116	60	131	88	146	90
225	250	-30	0	60	31	79	50	96	50	113	84	130	84
				90	31	109	50	126	50	143	84	160	84
				82	39	101	58	116	60	135	92	150	94
250	280	-35	0	66	34	88	56	108	56	126	94	146	94
				101	34	123	56	143	56	161	94	181	94
				92	43	114	65	131	68	152	103	169	106
280	315	-35	0	66	34	88	56	108	56	130	98	150	98
				101	34	123	56	143	56	165	98	185	98
				92	43	114	65	131	68	156	107	173	110
315	355	-40	0	73	37	98	62	119	62	144	108	165	108
				113	37	138	62	159	62	184	108	205	108
				102	48	127	73	146	75	173	119	192	121

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		n6		p6		p7		r6		r7	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
355	400	-40	0	73	37	98	62	119	62	150	114	171	114
				113	37	138	62	159	62	190	114	211	114
				102	48	127	73	146	75	179	125	198	127
400	450	-45	0	80	40	108	68	131	68	166	126	189	126
				125	40	153	68	176	68	211	126	234	126
				113	52	141	80	161	83	199	138	219	141
450	500	-45	0	80	40	108	68	131	68	172	132	195	132
				125	40	153	68	176	68	217	132	240	132
				113	52	141	80	161	83	205	144	225	147
500	560	-50	0	88	44	122	78	148	78	194	150	220	150
				138	44	172	78	198	78	244	150	270	150
				125	57	159	91	182	94	231	163	254	166
560	630	-50	0	88	44	122	78	148	78	199	155	225	155
				138	44	172	78	198	78	249	155	275	155
				125	57	159	91	182	94	236	168	259	171
630	710	-75	0	100	50	138	88	168	88	225	175	255	175
				175	50	213	88	243	88	300	175	330	175
				158	67	196	105	221	110	283	192	308	197
710	800	-75	0	100	50	138	88	168	88	235	185	265	185
				175	50	213	88	243	88	310	185	340	185
				158	67	196	105	221	110	293	202	318	207
800	900	-100	0	112	56	156	100	190	100	266	210	300	210
				212	56	256	100	290	100	366	210	400	210
				192	76	236	120	263	127	346	230	373	237
900	1000	-100	0	112	56	156	100	190	100	276	220	310	220
				212	56	256	100	290	100	376	220	410	220
				192	76	236	120	263	127	356	240	383	247
1000	1120	-125	0	132	66	186	120	225	120	316	250	355	250
				257	66	311	120	350	120	441	250	480	250
				233	90	287	144	317	153	417	274	447	283
1120	1250	-125	0	132	66	186	120	225	120	326	260	365	260
				257	66	311	120	350	120	451	260	490	260
				233	90	287	144	317	153	427	284	457	293

Application of Bearing

Shaft tolerance and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		n6		p6		p7		r6		r7	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		µm		µm									
1250	1400	-160	0	156	78	218	140	265	140	378	300	425	300
				316	78	378	140	425	140	538	300	585	300
				286	108	348	170	385	180	508	330	545	340
1400	1600	-160	0	156	78	218	140	265	140	408	330	455	330
				316	78	378	140	425	140	568	330	615	330
				286	108	348	170	385	180	538	360	575	370
1600	1800	-200	0	184	92	262	170	320	170	462	370	520	370
				384	92	462	170	520	170	662	370	720	370
				349	127	427	205	470	220	627	405	670	420
1800	200	-200	0	184	92	262	170	320	170	492	400	550	400
				384	92	462	170	520	170	692	400	750	400
				349	127	427	205	470	220	657	435	700	450

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		k5		k6		m5		m6		n5	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
1	3	-8	0	4	0	6	0	6	2	8	2	8	4
				12	0	14	0	14	2	16	2	16	4
				11	1	12	2	13	3	14	4	15	5
3	6	-8	0	6	1	9	1	9	4	12	4	13	8
				14	1	17	1	17	4	20	4	21	8
				13	2	15	3	16	5	18	6	20	9
6	10	-8	0	7	1	10	1	12	6	15	6	16	10
				15	1	18	1	20	6	23	6	24	10
				13	3	16	3	18	8	21	8	22	12
10	18	-8	0	9	1	12	1	15	7	18	7	20	12
				17	1	20	1	23	7	26	7	28	12
				15	3	18	3	21	9	24	9	26	14
18	30	-10	0	11	2	15	2	17	8	21	8	24	15
				21	2	25	2	27	8	31	8	34	15
				19	4	22	5	25	10	28	11	32	17
30	50	-12	0	13	2	18	2	20	9	25	9	28	17
				25	2	30	2	32	9	37	9	40	17
				22	5	26	6	29	12	33	13	37	20
50	80	-15	0	15	2	21	2	24	11	30	11	33	20
				30	2	36	2	39	11	45	11	48	20
				26	6	32	6	35	15	41	15	44	24
80	120	-20	0	18	3	25	3	28	13	35	13	38	23
				38	3	45	3	48	13	55	13	58	23
				33	8	39	9	43	18	49	19	53	28
120	180	-25	0	21	3	28	3	33	15	40	15	45	27
				46	3	53	3	58	15	65	15	70	27
				40	9	46	10	52	21	58	22	64	33
180	250	-30	0	24	4	33	4	37	17	46	17	51	31
				54	4	63	4	67	17	76	17	81	31
				48	10	55	12	61	23	68	25	75	37
250	315	-35	0	27	4	36	4	43	20	52	20	57	34
				62	4	71	4	78	20	87	20	92	34
				54	12	62	13	70	28	78	29	84	42

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		k5		k6		m5		m6		n5	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
315	400	-40	0	29	4	40	4	46	21	57	21	62	37
				69	4	80	4	86	21	97	21	102	37
				61	12	69	15	78	29	86	32	94	45
400	500	-45	0	32	5	45	5	50	23	63	23	67	40
				77	5	90	5	95	23	108	23	112	40
				68	14	78	17	86	32	96	35	103	49
500	630	-50	0	29	0	44	0	55	26	70	26	73	44
				78	0	94	0	104	26	120	26	122	44
				68	10	81	13	94	36	107	39	112	54
630	800	-75	0	32	0	50	0	62	30	80	30	82	50
				107	0	125	0	137	30	155	30	157	50
				95	12	108	17	125	42	138	47	145	62
800	1000	-100	0	36	0	56	0	70	34	90	34	92	56
				136	0	156	0	170	34	190	34	192	56
				122	14	136	20	156	48	170	54	178	70
1000	1250	-125	0	42	0	66	0	82	40	106	40	108	66
				167	0	191	0	207	40	231	40	233	66
				150	17	167	24	190	57	207	64	216	83
1250	1600	-160	0	50	0	78	0	98	48	126	48	128	78
				210	0	238	0	258	48	286	48	288	78
				189	21	208	30	237	69	256	78	267	99
1600	2000	-200	0	60	0	92	0	118	58	150	58	152	92
				260	0	292	0	318	58	350	58	352	92
				235	25	57	35	293	83	315	93	327	117

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		j6		js5		js6		js7		k4	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
1	3	-8	0	4	-2	2	-2	3	-3	5	-5	3	0
				12	-2	10	-2	11	-3	13	-5	11	0
				10	0	9	-1	9	-1	+11	-3	10	1
3	6	-8	0	6	-2	2.5	-2.5	4	-4	6	-6	5	1
				14	-2	10.5	-2.5	12	-4	14	-6	13	1
				12	0	9	-1	10	-2	12	-4	12	2
6	10	-8	0	7	-2	3	-3	4.5	-4.5	7.5	-7.5	5	1
				15	-2	11	-3	12.5	-4.5	15.5	-7.5	13	1
				13	0	9	-1	11	-3	13	-5	12	2
10	18	-8	0	8	-3	4	-4	5,5	-5.5	9	-9	6	1
				16	-3	12	-4	13.5	-5.5	17	-9	14	1
				14	-1	10	-2	11	-3	14	-5	13	2
18	30	-10	0	9	-4	4.5	-4.5	6.5	-6.5	10.5	-10.5	8	2
				19	-4	14.5	-4.5	16.5	-6.5	20.5	-10.5	18	2
				16	-1	12	-2	14	-4	17	-7	16	4
30	50	-12	0	11	-5	5.5	-5.5	8	-8	12.5	-12.5	9	2
				23	-5	17.5	-5.5	20	-8	24.5	-12.5	21	2
				19	-1	15	-3	16	-4	20	-8	19	4
50	80	-15	0	12	-7	6.5	-6.5	9.5	-9.5	15	-15	10	2
				27	-7	21.5	-6.5	24.5	-9.5	30	-15	25	2
				23	-3	18	-3	20	-5	25	-10	22	5
80	120	-20	0	13	-9	7.5	-7.5	11	-11	17.5	-17.5	13	3
				33	-9	27.5	-7.5	31	-11	37.5	-17.5	33	3
				27	-3	23	-3	25	-5	31	-11	30	6
120	180	-25	0	14	-11	9	-9	12.5	-12.5	20	-20	-15	3
				39	-11	34	-9	37.5	-12.5	45	-20	-40	3
				32	-4	28	-3	31	-6	37	-12	-36	7
180	250	-30	0	16	-13	10	-10	14,5	-14.5	23	-23	-18	4
				46	-13	40	-10	44.5	-14.5	53	-23	-48	4
				38	-5	34	-4	36	-6	43	-13	43	9
250	315	-35	0	16	-16	11.5	-11.5	16	-16	26	-26	20	4
				51	-16	46.5	-11.5	51	-16	61	-26	55	4
				42	-7	39	-4	42	-7	49	-14	49	10

Application of Bearing

Shaft tolerances and resultant fits

Shafts		Bearing		Deviations of shaft diameter, resultant fits									
Nominal diameter		Bore diameter tolerance		Tolerances									
d		Δ_{dmp}		j6		js5		js6		js7		k4	
over	incl.	low	high	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
315	400	-40	0	18	-18	12.5	-12.5	18	-18	28.5	-28.5	22	4
				58	-18	52.5	-12.5	58	-18	68.5	-28.4	62	4
				47	-7	44	-4	47	-7	55	-15	55	11
400	500	-45	0	20	-20	13.5	-13.5	20	-20	31.5	-31.5	25	5
				65	-20	58.5	-13.5	65	-20	76.5	-31.5	70	5
				53	-8	49	-4	53	-8	62	-17	63	-12
500	630	-50	0	22	-22	14	-14	22	-22	35	-35	-	-
				72	-22	64	-14	72	-22	85	-35	-	-
				59	-9	54	-4	59	-9	69	-19	-	-
630	800	-75	0	25	-25	16	-16	25	-25	40	-40	-	-
				100	-25	91	-16	100	-25	115	-40	-	-
				83	-8	79	-4	83	-8	93	-18	-	-
800	1000	-100	0	28	-28	18	-18	28	-28	45	-45	-	-
				128	-28	118	-18	128	-28	145	-45	-	-
				108	-8	104	-4	108	-8	118	-18	-	-
1000	1250	-125	0	33	-33	21	-21	33	-33	52	-52	-	-
				158	-33	146	-21	158	-33	177	-52	-	-
				134	-9	129	-4	134	-9	145	-20	-	-
1250	1600	-160	0	39	-39	25	-25	39	-39	62	-62	-	-
				199	-39	185	-25	199	-39	222	-62	-	-
				169	-9	164	-4	162	-9	182	-22	-	-
1600	2000	-200	0	46	-46	30	-30	46	-46	75	-75	-	-
				246	-46	230	-30	246	-46	275	-75	-	-
				211	-11	205	-5	211	-11	225	-25	-	-

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of housing bore diameter, resultant fits									
Nominal bore diameter		Outside diameter tolerance		Tolerances									
D		Δ_{Dmp}		F7		G6		G7		H5		H6	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
6	10	0	-8	13	28	5	14	5	20	0	6	0	9
				-13	-36	-5	-22	-5	-28	0	-14	0	-17
				-16	-33	-7	-20	-8	-25	-2	-12	-2	-15
10	18	0	-8	16	34	6	17	6	24	0	8	0	11
				-16	-42	-6	-25	-6	-32	0	-16	0	-19
				-19	-39	-8	-23	-9	-29	-2	-14	-2	-17
18	30	0	-9	20	41	7	20	7	28	0	9	0	13
				-20	-50	-7	-29	-7	-37	0	-18	0	-22
				-23	-47	-10	-26	-10	-34	-2	-16	-3	-19
30	50	0	-11	25	50	9	25	9	34	0	11	0	16
				-25	-61	-9	-36	-9	-45	0	-22	0	-27
				-29	-57	-12	-33	-13	-41	-3	-19	-3	-24
50	80	0	-13	30	60	10	29	10	40	0	13	0	19
				-30	-73	-10	-42	-10	-53	0	-26	0	-32
				-35	-68	-14	-38	-15	-48	-3	-23	-4	-28
80	120	0	-15	36	71	12	34	12	47	0	15	0	22
				-36	-86	-12	-49	-12	-62	0	-30	0	-37
				-41	-81	-17	-44	-17	-57	-4	-26	-5	-32
120	150	0	-18	43	83	14	39	14	54	0	18	0	25
				-43	-101	-14	-57	-14	-72	0	-36	0	-43
				-50	-94	-20	-51	-21	-65	-5	-31	-6	-37
150	180	0	-25	43	83	14	39	14	54	0	18	0	25
				-43	-108	-14	-64	-14	-79	0	-43	0	-50
				-51	-100	-21	-57	-22	-71	-6	-37	-7	-43
180	250	0	-30	50	96	15	44	15	61	0	20	0	29
				-50	-126	-15	-74	-15	-91	0	-50	0	-59
				-60	-116	-23	-66	-25	-81	-6	-44	-8	-51
250	315	0	-35	56	108	17	49	17	69	0	23	0	32
				-56	-143	-17	-84	-17	-104	0	-58	0	-67
				-68	-131	-26	-75	-29	-92	-8	-50	-9	-58

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of housing bore diameter, resultant fits									
Nominal bore diameter		Outside diameter tolerance		Tolerances									
D		Δ_{Dmp}		F7		G6		G7		H5		H6	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
315	400	0	-40	62	119	18	54	18	75	0	25	0	36
				-62	-159	-18	-94	-18	-115	0	-65	0	-76
				-75	-146	-29	-83	-31	-102	-8	-57	-11	-65
400	500	0	-45	68	131	20	60	20	83	0	27	0	40
				-68	-176	-20	-105	-20	-128	0	-72	0	-85
				-83	-161	-32	-93	-35	-113	-9	-63	-12	-73
500	630	0	-50	76	146	22	66	22	92	0	28	0	44
				-76	-196	-22	-116	-22	-142	0	-78	0	-94
				-92	-180	-35	-103	-38	-126	-10	-68	-13	-81
630	800	0	-75	80	160	24	74	24	104	0	32	0	50
				-80	-235	-24	-149	-24	-179	0	-107	0	-125
				-102	-213	-41	-132	-46	-157	-12	-95	-17	-108
800	1000	0	-100	86	176	26	82	26	116	0	36	0	56
				-86	-276	-26	-182	-26	-216	0	-136	0	-156
				-113	-249	-46	-162	-53	-189	-14	-122	-20	-136
1000	1250	0	-125	98	203	28	94	28	133	0	42	0	66
				-98	-328	-28	-219	-28	-258	0	-167	0	-191
				-131	-295	-52	-195	-61	-225	-17	-150	-24	-167
1250	1600	0	-160	110	235	30	108	30	155	0	50	0	78
				-110	-395	-30	-268	-30	-315	0	-210	0	-238
				-150	-355	-60	-238	-70	-275	-21	-189	-30	-208
1600	2000	0	-200	120	270	32	124	32	182	0	60	0	92
				-120	-470	-32	-324	-32	-382	0	-260	0	-292
				-170	-420	-67	-289	-82	-332	-25	-215	-35	-257
2000	2500	0	-250	130	305	34	144	34	209	0	70	0	110
				-130	-555	-34	-394	-34	-459	0	-320	0	-360
				-189	-496	-77	-351	-93	-400	-30	-290	-43	-317

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of housing bore diameter, resultant fits									
Nominal bore diameter		Outside diameter tolerance		Tolerances									
D		Δ_{Dmp}		H7		H8		H9		H10		J6	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
6	10	0	-8	0	15	0	22	0	36	0	58	-4	5
				0	-23	0	-30	0	-44	0	-66	4	-13
				-3	-20	-3	-27	-3	-41	-3	-63	2	-11
10	18	0	-8	0	18	0	27	0	43	0	70	-5	6
				0	-26	0	-35	0	-51	0	-78	5	-14
				-3	-23	-3	-32	-3	-48	-3	-75	3	-12
18	30	0	-9	0	21	0	33	0	52	0	84	-5	8
				0	-30	0	-42	0	-61	0	-93	5	-17
				-3	-27	-3	-39	-4	-57	-4	-89	2	-14
30	50	0	-11	0	25	0	39	0	62	0	100	-6	10
				0	-36	0	-50	0	-73	0	-111	6	-21
				-4	-32	-4	-46	-5	-68	-5	-106	3	-18
50	80	0	-13	0	30	0	46	0	74	0	120	-6	13
				0	-43	0	-59	0	-87	0	-133	6	-26
				-5	-38	-5	-54	-5	-82	-6	-127	2	-22
80	120	0	-15	0	35	0	54	0	87	0	140	-6	16
				0	-50	0	-69	0	-102	0	-155	6	-31
				-5	-45	-6	-63	-6	-96	-7	-148	1	-26
120	150	0	-18	0	40	0	63	0	100	0	160	-7	18
				0	-58	0	-81	0	-118	0	-178	7	-36
				-7	-51	-7	-74	-8	-110	-8	-170	1	-30
150	180	0	-25	0	40	0	63	0	100	0	160	-7	18
				0	-65	0	-88	0	-125	0	-185	7	-43
				-8	-57	-10	-78	-10	-115	-11	-174	0	-36
180	250	0	-30	0	46	0	72	0	115	0	185	-7	22
				0	-76	0	-102	0	-145	0	-215	7	-52
				-10	-66	-12	-90	-13	-132	-13	-202	-1	-44
250	315	0	-35	0	52	0	81	0	130	0	210	-7	25
				0	-87	0	-116	0	-165	0	-245	7	-60
				-12	-75	-13	-103	-15	-150	-16	-229	-2	-51
315	400	0	-40	0	57	0	89	0	140	0	230	-7	29
				0	-97	0	-129	0	-180	0	-270	7	-69
				-13	-84	-15	-114	-17	-163	-18	-252	-4	-58

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of housing bore diameter, resultant fits									
Nominal bore diameter		Outside diameter tolerance		Tolerances									
D		Δ_{Dmp}		H7		H8		H9		H10		J6	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
400	500	0	-45	0	63	0	97	0	155	0	250	-7	33
				0	-108	0	-142	0	-200	0	-295	7	-78
				-15	-93	-17	-125	-19	-181	-20	-275	-5	-66
500	630	0	-50	0	70	0	110	0	175	0	280	-	-
				0	-120	0	-160	0	-225	0	-330	-	-
				-16	-104	-19	-141	-21	-204	-22	-308	-	-
630	800	0	-75	0	80	0	125	0	200	0	320	-	-
				0	-155	0	-200	0	-275	0	-395	-	-
				-22	-133	-27	-173	-30	-245	-33	-362	-	-
800	1000	0	-100	0	90	0	140	0	230	0	360	-	-
				0	-190	0	-240	0	-330	0	-460	-	-
				-27	-163	-33	-207	-39	-291	-43	-417	-	-
1000	1250	0	-125	0	105	0	165	0	260	0	420	-	-
				0	-230	0	-290	0	-385	0	-545	-	-
				-33	-197	-41	-249	-48	-337	-53	-492	-	-
1250	1600	0	-160	0	125	0	195	0	310	0	500	-	-
				0	-285	0	-355	0	-470	0	-660	-	-
				-40	-245	-51	-304	-60	-410	-67	-593	-	-
1600	2000	0	-200	0	150	0	230	0	370	0	600	-	-
				0	-350	0	-430	0	-570	0	-800	-	-
				-50	-300	-62	-368	-74	-496	-83	-717	-	-
2000	2500	0	-250	0	175	0	280	0	440	0	700	-	-
				0	-425	0	-530	0	-690	0	-950	-	-
				-59	-366	-77	-453	-91	-599	-103	-847	-	-

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of shaft diameter, resultant fits									
Nominal bore diameter		Outside diameter tolerance		Tolerances									
D		Δ_{Dmp}		J7		JS5		JS6		JS7		K5	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
6	10	0	-8	-7	8	-3	3	-4.5	4.5	-7.5	7.5	-5	1
				7	-16	3	-11	4.5	-12.5	7.5	-15.5	5	-9
				4	-13	1	-9	3	-11	5	-13	3	-7
10	18	0	-8	-8	10	-4	4	-5.5	5.5	-9	9	-6	2
				8	-18	4	-12	5.5	-13.5	9	-17	6	-10
				5	-15	2	-10	3	-11	6	-14	4	-8
18	30	0	-9	-9	12	-4.5	4.5	-6.5	6.5	-10.5	10.5	-8	1
				9	-21	4.5	-13.5	6.5	-15.5	10.5	-19.5	8	-10
				6	-18	2	-11	4	-13	7	-16	6	-8
30	50	0	-11	-11	14	-5.5	5.5	-8	8	-12.5	12.5	-9	2
				11	-25	5.5	-16.5	8	-19	12.5	-23.5	9	-13
				7	-21	3	-14	5	-16	9	-20	6	-10
50	80	0	-13	-12	18	-6.5	6.5	-9.5	9.5	-15	15	-10	3
				12	-31	6.5	-19.5	9.5	-22.5	15	-28	10	-16
				7	-26	3	-16	6	-19	10	-23	7	-13
80	120	0	-15	-13	22	-7.5	7.5	-11	11	-17.5	17.5	-13	2
				13	-37	7.5	-22.5	11	-26	17.5	-32.5	13	-17
				8	-32	4	-19	6	-21	12	-27	9	-13
120	150	0	-18	-14	26	-9	9	-12.5	12.5	-20	20	-15	3
				14	-44	9	-27	12.5	-30.5	20	-38	15	-21
				7	-37	4	-22	7	-25	13	-31	10	-16
150	180	0	-25	-14	26	-9	9	-12.5	12.5	-20	20	-15	3
				14	-51	9	-34	12.5	-37.5	20	-45	15	-28
				6	-43	3	-28	6	-31	12	-37	9	-22
180	250	0	-30	-16	30	-10	10	-14.5	14.5	-23	23	-18	2
				16	-60	10	-40	14.5	-44.5	23	-53	18	-32
				6	-50	4	-34	6	-36	13	-43	12	-26
250	315	0	-35	-16	36	-11.5	11.5	-16	16	-26	26	-20	3
				16	-71	11.5	-46.5	16	51	26	-61	20	-38
				4	-59	4	-39	7	-42	14	-49	12	-30
315	400	0	-40	-18	39	-12.5	12.5	-18	18	-28.5	28.5	-22	3
				18	-79	12.5	-52.5	18	-58	28.5	-68.5	22	-43
				5	-66	4	-44	7	-47	15	-55	14	-35

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of shaft diameter, resultant fits									
Nominal bore diameter		Outside diameter tolerance		Tolerances									
D		Δ_{Dmp}		J7		JS5		JS6		JS7		K5	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
400	500	0	-45	-20	43	-13.5	13.5	-20	20	-31.5	31.5	-25	2
				20	-88	13.5	-58.5	20	-65	31.5	-76.5	25	-47
				5	-73	4	-49	8	-53	17	-62	16	-38
500	630	0	-50	-	-	-14	14	-22	22	-35	35	-	-
				-	-	14	-64	22	-72	35	-85	-	-
				-	-	4	-54	8	-59	19	-69	-	-
630	800	0	-75	-	-	-16	16	-25	25	-40	40	-	-
				-	-	16	-91	25	-100	40	-115	-	-
				-	-	4	-79	8	-83	18	-93	-	-
800	1000	0	-100	-	-	-18	18	-28	28	-45	45	-	-
				-	-	18	-118	28	-128	45	-145	-	-
				-	-	4	-104	8	-108	18	-118	-	-
1000	1250	0	-125	-	-	-21	21	-33	33	-52	52	-	-
				-	-	21	-146	33	-158	52	-177	-	-
				-	-	4	-129	9	-134	20	-145	-	-
1250	1600	0	-160	-	-	-25	25	-39	39	-62	62	-	-
				-	-	25	-185	39	-199	62	-222	-	-
				-	-	4	-164	9	-169	22	-182	-	-
1600	2000	0	-200	-	-	-30	30	-46	46	-75	75	-	-
				-	-	30	-230	46	-246	75	-275	-	-
				-	-	5	-205	11	-211	25	-225	-	-
2000	2500	0	-250	-	-	-35	35	-55	55	-87	87	-	-
				-	-	35	-285	55	-305	87	-337	-	-
				-	-	5	-255	12	-262	28	-278	-	-

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of shaft diameter, resultant fits									
Nominal bore diameter		Outside diameter tolerance		Tolerances									
D		Δ_{Dmp}		K6		K7		M5		M6		M7	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
6	10	0	-8	-7	2	-10	5	-10	-4	-12	-3	-15	0
				7	-10	10	-13	10	-4	12	-5	15	-8
				5	-8	7	-10	8	-2	10	-3	12	-5
10	18	0	-8	-9	2	-12	6	-12	-4	-15	-4	-18	0
				9	-10	12	-14	12	-4	15	-4	18	-8
				7	-8	9	-11	10	-2	-13	-2	15	-5
18	30	0	-9	-11	2	-15	6	-14	-4	-17	-4	-21	0
				11	-11	15	-15	14	-4	17	-5	21	-9
				8	-8	12	-12	12	-2	14	-2	18	-6
30	50	0	-11	-13	3	-18	7	-16	-5	-20	-4	-25	0
				13	-14	18	-18	16	-6	20	-7	25	-11
				10	-11	14	-14	13	-3	17	-4	21	-7
50	80	0	-13	-15	4	-21	9	-19	-6	-24	-5	-30	0
				15	-17	21	-22	19	-7	24	-8	30	-13
				11	-13	16	-17	16	-4	20	-4	25	-8
80	120	0	-15	-18	4	-25	10	-23	-8	-28	-6	-35	0
				18	-19	25	-25	23	-7	28	-9	35	-15
				13	-14	20	-20	19	-3	23	-4	30	-10
120	150	0	-18	-21	4	-28	12	-27	-9	-33	-8	-40	0
				21	-22	28	-30	27	-9	33	10	40	-18
				15	-16	21	-23	22	-4	27	-4	33	-11
150	180	0	-25	-21	4	-28	12	-27	-9	-33	-8	-40	0
				21	-29	28	-37	27	-16	33	-17	40	-25
				14	-22	20	-29	21	-10	26	-10	32	-17
180	250	0	-30	-24	-5	-33	13	-31	-11	-37	-8	-46	0
				24	-35	33	-43	31	-19	37	-22	46	-30
				16	-27	23	-33	25	-13	29	-14	36	-20
250	315	0	-35	-27	5	-36	16	-36	-13	-41	-9	-52	0
				27	-40	36	-51	36	-22	41	-26	52	-35
				18	-31	24	-39	28	-14	32	-17	40	-23
315	400	0	-40	-29	7	-40	17	-39	-14	-46	-10	-57	0
				29	-47	40	-57	39	-26	46	-30	57	-40
				18	-36	27	-44	31	-18	35	-19	44	-27

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of shaft diameter, resultant fits									
Nominal bore diameter		Outside diameter tolerance		Tolerances									
D		Δ_{Dmp}		K6		K7		M5		M6		M7	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)									
mm		μm		μm									
400	500	0	-45	-32	8	-45	18	-43	-16	-50	-10	-63	0
				32	-53	45	-63	43	-29	50	-35	63	-45
				20	-41	30	-48	34	-20	38	-23	48	-30
500	630	0	-50	-44	0	-70	0	-	-	-70	-26	-96	-26
				44	-50	70	-50	-	-	70	-24	96	-24
				31	-37	54	-34	-	-	57	-11	80	-8
630	800	0	-75	-50	0	-80	0	-	-	-80	-30	-110	-30
				50	-75	80	-75	-	-	80	-45	110	-45
				33	-58	58	-53	-	-	63	-28	88	-23
800	1000	0	-100	-56	0	-90	0	-	-	-90	-34	-124	-34
				56	-100	90	-100	-	-	90	-66	124	-66
				36	-80	63	-73	-	-	70	-46	97	-39
1000	1250	0	-125	-66	0	-105	0	-	-	-106	-40	-145	-40
				66	-125	105	-125	-	-	106	-85	145	-85
				42	-101	72	-92	-	-	82	-61	112	-52
1250	1600	0	-160	-78	0	-125	0	-	-	-126	-48	-173	-48
				78	-160	125	-160	-	-	126	-112	173	-112
				48	-130	+85	-120	-	-	96	-82	133	-72
1600	2000	0	-200	-92	0	-150	0	-	-	-158	-58	-208	-58
				92	-200	150	-200	-	-	150	-142	208	-142
				57	-165	100	-150	-	-	115	-107	158	-92
2000	2500	0	-250	-110	0	-175	0	-	-	-178	-68	-243	-68
				110	-250	175	-250	-	-	178	-182	243	-182
				67	-207	116	-191	-	-	135	-139	184	-123

Application of Bearing

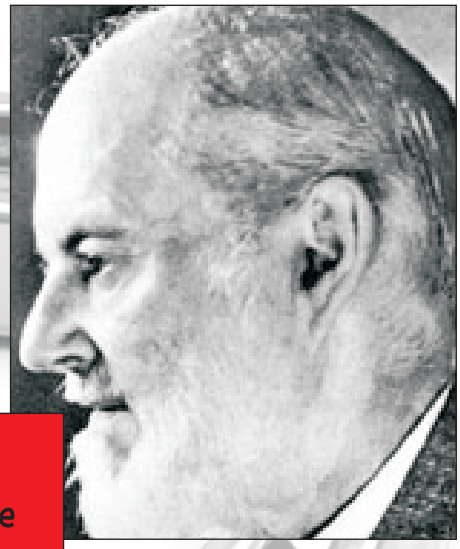
Housing tolerances and resultant fits

Housing		Bearing		Deviations of shaft diameter, resultant fits							
Nominal bore diameter		Outside diameter tolerance		Tolerances							
D		Δ_{Dmp}		N6		N7		P6		P7	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)							
mm		μm		μm							
6	10	0	-8	-16	-7	-19	-4	-21	-12	-24	-9
				16	-1	19	-4	21	4	24	1
				14	1	16	-1	19	6	21	4
10	18	0	-8	-20	-9	-23	-5	-26	-15	-29	-11
				20	1	23	-3	26	7	29	3
				18	3	20	0	24	9	26	6
18	30	0	-9	-24	-11	-28	-7	-31	-18	-35	-14
				24	2	28	-2	31	9	35	5
				21	5	25	1	28	12	32	8
30	50	0	-11	-28	-12	-33	-8	-37	-21	-42	-17
				28	1	33	-3	37	10	42	6
				25	4	29	1	34	13	38	10
50	80	0	-13	-33	-14	39	-9	-45	-26	-51	-21
				33	1	39	-4	45	13	51	8
				29	5	34	1	41	17	46	13
80	120	0	-15	-38	-16	-45	-10	-52	-30	-59	-24
				38	1	45	-5	52	15	59	9
				33	6	40	0	47	20	54	14
120	150	0	-18	-45	-20	-52	-12	-61	-36	-68	-28
				45	2	52	-6	61	18	68	10
				39	8	45	1	55	24	61	17
150	180	0	-25	-45	-20	-52	-12	-61	-36	-68	-28
				45	-5	52	-13	61	11	68	3
				38	2	44	-5	54	18	60	11
180	250	0	-30	-51	-22	-60	-14	-70	-41	-79	-33
				51	-8	60	-16	70	11	79	3
				43	0	50	-6	62	19	69	13
250	315	0	-35	-57	-25	-66	-14	-79	-47	-88	-36
				57	-10	66	-21	79	12	88	1
				48	-1	54	-9	70	21	76	13
315	400	0	-40	-62	-26	-73	-16	-87	-51	-98	-41
				62	-14	73	-24	87	11	98	1
				51	-3	60	-11	76	22	85	14

Application of Bearing

Housing tolerances and resultant fits

Housing		Bearing		Deviations of shaft diameter, resultant fits							
Nominal bore diameter		Outside diameter tolerance		Tolerances							
D		Δ_{Dmp}		N6		N7		P6		P7	
over	incl.	high	low	Deviations(shaft diameter) Theortitical interference(+)/clearance(-) Probable interference (+)Clearance(-)							
mm		μm		μm							
400	500	0	-45	-67	-27	-80	-17	-95	-55	-108	-45
				67	-18	80	-28	95	10	108	0
				55	-6	65	-13	83	22	93	15
500	630	0	-50	-88	-44	-114	-44	-122	-78	-148	-78
				88	-6	114	-6	122	-28	148	28
				75	7	98	10	100	41	132	44
630	800	0	-75	-100	-50	-130	-50	-138	-88	-168	-88
				100	-25	130	-25	138	13	168	13
				83	-8	108	-3	121	30	146	35
800	1000	0	-100	-112	-56	-146	-56	-156	-100	-190	-100
				112	-44	146	-44	156	0	190	0
				92	-24	119	-17	136	20	163	27
1000	1250	0	-125	-132	-66	-171	-66	-186	-120	-225	-120
				132	-59	171	-59	186	-5	225	-5
				108	-35	138	-26	162	19	192	28
1250	1600	0	-160	-156	-78	-203	-78	-218	-140	-265	-140
				156	-82	203	-82	218	-20	265	-20
				126	-52	163	-42	188	10	225	20
1600	2000	0	-200	-184	-92	-242	-92	-262	-170	-320	-170
				184	-108	242	-108	262	-30	320	-30
				149	-73	192	-58	227	5	270	20
2000	2500	0	-250	-220	-110	-285	-110	-305	-195	-370	-195
				220	-140	285	-140	305	-55	370	-55
				177	-97	226	-81	262	12	311	4



"Strive for perfection in everything you do. Take the best that exists and make it better. When it does not exist, design it."

Sir Henry Royce

Lubrication

- Grease Lubrication
- Oil Lubrication
- Lubricating Grease

Lubrication

Principles

Lubrication and maintenance are important for the reliable Operation and long operating life of rolling bearings.

Functions of the lubricant

The lubricant should,

- form a lubricant film on the contact surfaces that is sufficiently capable of supporting loads and thus preventing wear and premature fatigue
- dissipates heat in the case of oil lubrication
- give additional sealing of the bearing, in the case of grease lubrication, against the entry of both solid and fluid contaminants
- reduce the running noise
- protect the bearing against corrosion

Selection of the type of lubrication

It should be determined as early as possible in the design process whether bearings should be lubricated using grease or oil.

The following factors are decisive in determining the type of lubrication an quantity of lubricant:

- the operating conditions
- the type and size of the bearing
- the adjacent construction
- the lubricant feed

Criteria for grease lubrication

In the case of grease lubrication, the following criteria must be considered ;

- sealing action
- long operating life with little maintenance work
- no heat dissipation by the lubricant
- no rinsing out of wear debris and other particles.

Grease lubrication

Grease can be used to lubricate rolling bearing under normal operating conditions in the majority of applications.

Grease has the advantage over oil that it is more easily retained in the bearing arrangement, particularly where shafts are inclined or vertical, and it also contributes to sealing the arrangement against contaminants, moisture of water.

Excessive amounts of grease will cause the operating temperature within the bearing to rise rapidly, particularly when running at high speeds.

However, where bearings are to operate at very low speeds and good protection against contamination and corrosion is required, it is advisable to fill the housing completely with grease.

Greases can be differentiated in terms of their thickeners and base oils.

Types of grease

The characteristics of a grease are dependent on:

- the base oil
- the viscosity of the base oil
- (this is important for the speed range)
- the thickener
- (the shear strength is significant for the speed range)
- the additives.

Selection of suitable grease

Suitable greases should be selected in accordance with the operating conditions of the bearing:

- temperature
- compressive load
- speed
- the presence of water/moisture.

Lubrication

Operating temperature range

The operating temperature range of the grease must correspond to the range of possible operating temperature In the rolling bearing. Grease manufactures indicate an operating temperature range for their rolling bearing greases.

ZNL Group recommend s that greases should be use in accordance with the bearing temperature normally occurring in the standard operating range in order to achieve a reliable lubricating action and an acceptable grease operating life,

Pressure properties

The viscosity at operating temperature must be sufficiently high for the formation of a lubricant film capable of supporting loads. At high loads, greases with EP characteristics- "extreme pressure"and high base oil viscosity should be used

Speed

Grease should be selected in accordance with the speed

- For rolling bearings running at high speeds or with a low starting Torque, greases with a high speed parameter should be used.
- For bearings running at low speeds, greases with a low speed Parameter should be used.

Water/moisture

Water in the grease has a highly detrimental effect on the operating life of the bearing:

- The static behavior of greases in the presence of water is Assessed
- the anti-corrosion characteristics can be tested

Grease reservoir on both sides

The initial greasing quantity is between 30% and 100 % of the available volume in the bearing, dependent on the bearing type and operating conditions.

A grease reservoir can extend the grease operating life. The grease in the reservoir must be in constant contact with the grease on the raceway. The grease operating life does not increase proportionally with the size of the grease reservoir.

The volume of the grease reservoir should correspond to the area in the bearing between the inner and outer ring(not taking account of the cage and rolling elements),

Evaporation of the base oil should be prevented by design measures, for example by sealing shields,

Miscibility

Mixing of grease should be avoided if at all possible.

If mixing of greases is unavoidable, the following preconditions must be fulfilled:

- Same base oil
- Compatible thickener types
- Similar base oil viscosities-
- differing by no more than one ISO VG class
- Same consistency- NLGI class.

Storage

Experience shows that the greases used can be stored for up to 3 years The preconditions are:

- a closed room or store
- temperatures between 0 oC and + 40 oC
- relative humidity no more than 65%
- no influence of chemical agents-vapours, gases, fluids the bearings are sealed.

Lubrication

Greases-technical specification and characteristics
Part 1 : Technical Specification

Designation	Description	NLGI class	Thickener/ base oil	Base oil viscosity at 40 °C	100 °C	Temperature limits LTL[1]	HTPL[2]
-	-	-	-	mm²/s		°C	
LGMT 2	All purpose industrial and automative	2	Lithium soap/ mineral oil	110	11	-30	+120
LGMT 3	All purpose industrial and automative	3	Lithium soap/ mineral oil	120	12	-30	+120
LGEP 2	Extreme pressure,heavy load	2	Lithium soap/ mineral oil	200	16	-20	+110
LGLT 2	Light load and low temperature, high speed	2	Lithium soap/ diester oil	15	3,7	-55	+100
LGHP 2	High performance and high temperature	2-3	Di-urea/ mineral oil	96	10,5	-40	+150
LGFP 2	Food compatible	2	Aluminium complex / medical white oil	130	7.3	-20	+110
LGGB 2	Biodegradable and low toxicity	2	Lithium-calcium soap/ ester oil	110	13	-40	+120
LGWA 2	Wide temperature range	2	Lithium complex soap/ mineral oil	185	15	-30 peaks:	+140 +220
LGHB 2	High Viscosity and high temperature	2	Calcium complex sulphonate/mineral oil	450	26,5	-20 peaks:	+150 +200
LGET 2	Extreme temperature	2	PTFE/synthetic (fluorinated polyether)	400	38	-40	+260
LGEM 2	High Viscosity with solid lubricants	2	Lithium soap/ mineral oil	500	32	-20	+120
LGEV 2	Extreme high viscosity with solid lubricants	2	Lithium-calcium soap/ mineral oil	1000	58	-10	+120
LGWM 1	Extreme pressure, low temperature	1	Lithium soap/ mineral oil	200	16	-30	+110

Lubrication

Greases-technical specification and characteristics

Part 2 : Characteristics

Designation	High tempera-ture, above 120 °C	Low tempera-ture	Very high speed	Very low speed or oscil-lations	Low torque, low friction	Severe vibra-tions	Heavy loads	Rust inhibit-ing proper-ties	Water resist-ance
LGMT 2			0	-	+	+	0	+	+
LGMT 3			0	-	0	+	0	0	+
LGEP 2			0	0	-	+	+	+	+
LGLT 2		+	+	-	+	-	-	0	0
LGHP 2	+	0	+	-	0	+	0	+	+
LGFP 2			0	-	0	0		+	+
LGGB 2		0	0	0	0	+	+	0	+
LGWA 2	+		0	0	0	+	+	+	+
LGHB 2	+		0	+	-	+	+	+	+
LGET 2	Contact the application engineering service								
LGEM 2			-	+	-	+	+	+	+
LGEV 2		-	-	+	-	+	+	+	+
LGWM 1		+	0	0	0	-	+	+	+

Lubrication

Types of Greases

The properties and structure of some of the greases are as follows

Thickening agent	Basic oil	Use for temperature oC	Remarks
Lithium soap	Mineral oil	-30/120(130)	Multipurpose grease
Lithium soap	Easter oil	-60/130	For low temperature and high speed
Lithium soap	Silicon oil	-40/170	Low and higher temperature at medium speeds and low loads
Bentonite	Mineral oil /or ester oil	-20/150	Gel grease for higher temperature at low speed
Polyurea	Mineral oil	-20/150	For higher speeds, temperature and loads
Calcium soap	Mineral oil	-20/150	Water resistant
Calcium complex soap	Mineral oil	-30/150	Multipurpose grease for higher temperature and loads.
Calcium soap	Mineral oil	-20/60	Stable to churning
Sodium soap	Mineral oil	-30/80(100)	Able to emulsify with water
Sodium complex soap	Mineral oil	-20/130	For higher temperature and higher loads
Aluminum soap	Mineral oil	-20/70	Good sealing effect against water
Aluminum complex soap	Mineral oil	-40/150	For higher speeds, temperature and loads
Barium complex soap	Mineral oil	-20/150	For higher speeds, temperature and loads
Barium complex soap	Ester oil	-60/130	Vapor resistant, higher speeds and low temperature

Type of Greases

(A) Lithium base greases

This combines the advantages of calcium and sodium base greases and may be regarded as the most frequently used soap base greases. Lithium base greases are water repellent within certain limits and may also be used in the case of moisture if corrosion inhibitors are added. Oxidation inhabiting additives prolong the life of the lubricant. For higher loads lithium base greases with extreme pressure additives are available. On account of these advantages lithium base greases are used in the sealed bearings.

(B) Non soap greases

This contains inorganic or organic non-soap thickners. They are used for extremes applications (aggressive chemicals, vacume and ionizing radiation).

(C) Calcium complex greases

At higher temperature they do not soften as easily as is the case with the others greases, they have been found to harden on abrupt cooling. They act as corrosion inhibitors and are water resistant. If possible, the bearing housing should be packed up with grease.

(D) Calcium base greases

These are water resistant, stable to churning and are characterized by favorable low temperature behavior. In the case of moisture they do not prevent corrosion. Load carrying capacity and thermal load capacity can be increased by additives.

(E) Sodium base greases

They are able to emulsify with water and thrust prevent corrosion .this however, result in the formation of thin liquid grease, which may easily leak out, from the bearing.

(F) Sodium complex soap base greases

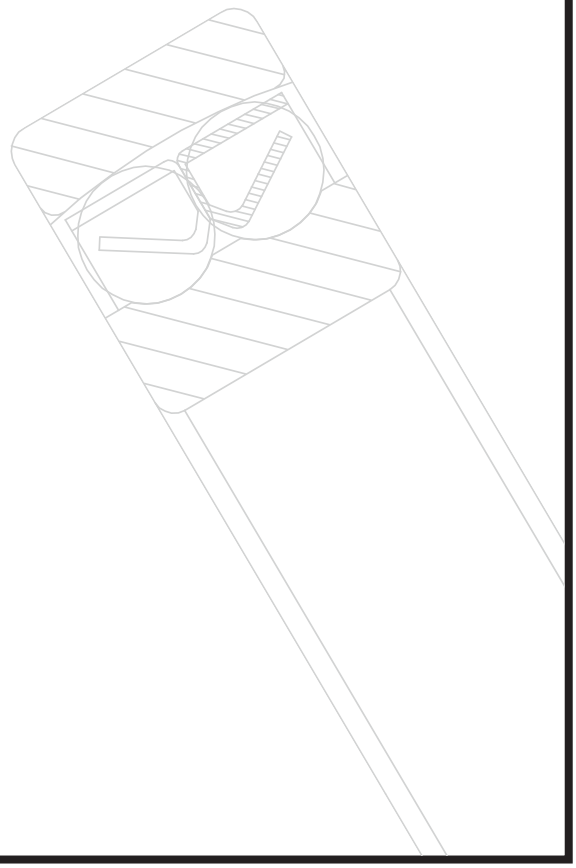
These are used for temperature from -40 C up to 150 C(223 423) they do not harden on cooling down.

(G) Mixed soap base greases

They contains two soaps, the combination Na/Ca, Na/Al, Li/Ca and Li/Na are most commonly used.

For the re-lubrication of rolling bearings the following should be taken into consideration:

- Calcium base greases and lithium bases greases can be mixed, all other greases with different soap bases cannot be mixed.



Lubrication

Oil Lubrication:

Oil lubrication is necessary in applications where

- Maximum permissible speed for grease increases.
- High external or frictional heat develops within the bearings.

Criteria for oil lubrication

In the case of oil lubrication, the following criteria must be considered;

- good lubricant distribution an supply to contact areas
- dissipation of heat possible from the bearing
- rinsing out of wear debris
- very low friction losses with minimal quantity lubrication

Under extreme operating conditions (such as very high temperatures, vacuum,aggressive media), it may be possible to use speciallubrication methods such as soli lubricants in consultation with the engineering service.

For the lubrication of rolling bearings, mineral oils and synthetic oils are essentially suitable. Oils with a mineral oil base are used most frequently.

Selection of suitable oil

The achievable lif and security against wear are higher with better Separation of the contact surfaces by a lubricant film, and section Load carrying capacity and life.

Reference viscosity for mineral oils

Reference viscosity is dependent on:

- the mean bearing diameter d_M and the speed n.
- the EHD theory on the formation of a lubricant film
- practical experience

Influence of Temperature on Viscosity

As the temperature Increases, the viscosity of the oil decrease.

The oil must therefore be selected to be sufficiently viscous that the Longest possible fatigue life is achieved while ensuring satisfactory Supply of oil to the bearings at all times.

Pressure properties of oil

If the bearings are subjected to high loads or the operating viscosity Is less than the reference viscosity, oils with anti-wear additives (type P to DIN 51 502) should be used.

These additives form boundary layers to reduce the harmful effects of metallic contact occurring at various areas(wear).

The suitability of these additives varies and is normally heavily dependent on temperature.

Miscibility

Mixing of different oils should be avoided wherever possible. In particular, the presence of different additive packages may lead to Undesirable interactions.

In general, oils with a mineral oil base and the same classification are miscible, for example two oils both of type HLP can be mixed.

Cleanliness

The cleanliness of the oil influences the rating life of bearings, See section Expanded adjusted rating life.

Recommendation:

- An oil filter should be provided and attention should be paid to the filtration rate(recommended filter mesh < 25 μm).

Lubricating systems:

The lubricating system depends on the environmental and operating conditions. The most frequently used oil lubricating systems are:

- Oil bath lubrication

Lubrication

- Circulating oil lubrication
- Oil mist lubrication
- Oil air lubrication
- Splash oil lubrication
- Total loss lubrication

Oil bath lubrication

It is widely used in case of low or medium speeds. The oil level should be maintained at the centre of the lowest rolling element .for controlling the oil level it is desirable to provide the sight gauge. The oil change intervals depend on the ageing of oil and the extent of impurities.

Circulating oil Lubrication

This is used for high-speed operation requiring bearing cooling and for bearings used at high temperature. In this case oil pump have to be used. The out feed lines and ducts must be large enough to avoid the oil built-up.the oil built –up may inhibit or even prevent the heat transfer and neutralize the seals. When large quantity of oil is used, the oil feeding into the bearing must be checked; otherwise a considerable amount of additional friction may develop.

Oil mist Lubrication

Oil mist lubrication is also called as the fog lubrication. In this oil is sprayed into the bearing. It has the following advantages.

1. Because of small quantity of oil required the oil resistance is small and higher speed is possible.
2. Contamination of the vicinity around the bearing slight because the oil leakage is small.
3. It is relatively easy to continuously supply fresh oil; therefore, the bearing life is extended.

Oil air lubrication

In this very small amount of oil is discharged intermittently by the constant quantity piston into the pipe carrying a constant flow of compressed air. The major advantages are as follows:

a. Due to minimum amount of oil supply, this method is suitable for high speeds because less heat is generated

b. Due to less amount of continuously oil feeding, the temperature remains stable.

c. There is no atmospheric pollution

d. Since compressed air is always feed to the bearing and internal pressure is high, so dust, cutting fluid etc cannot enter.

Splash oil lubrication

In this case the bearing is not submerging into the oil. The oil is splashed into the bearing by gears or simple rotating disc. It is commonly used in automobile transmission and final drive. Constructional

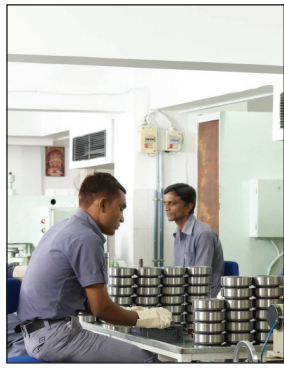
Measures must be applied to make sure that all bearings get sufficient oil during the running in period.

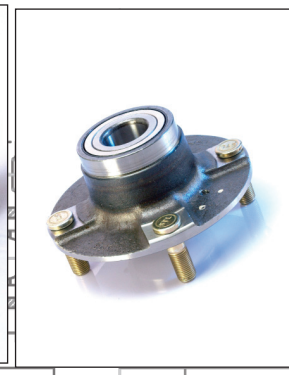
If rolling bearings are to operate reliably they must be adequately lubricated to prevent direct metal-to-metal contact between the rolling elements, raceways and cages. The lubricant also inhibits wear and protects the bearing surfaces against corrosion. The choice of a suitable lubricant and method of lubrication for each individual bearing application is therefore important, as is correct maintenance.

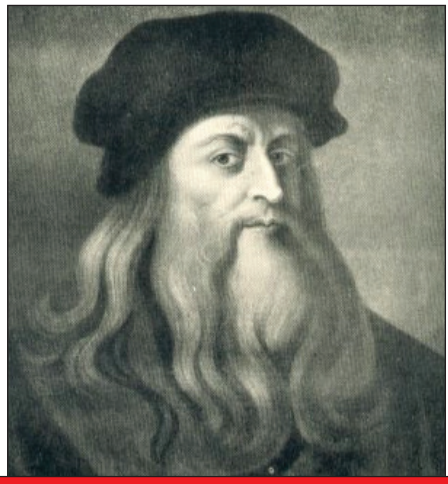
The most favourable operating temperatures will be obtained when the minimum amount of lubricant needed for reliable bearing lubrication is provided.

Oil is generally used for rolling bearing lubrication when high speeds or operating temperatures preclude the use of grease, when frictional or applied heat has to be removed from the bearing position, or when adjacent components (gears etc.) are lubricated with oil.

THE COMMITMENT TO QUALITY...
THE COMMITMENT TO GROWTH...
Precision Bearings Pvt. Ltd.





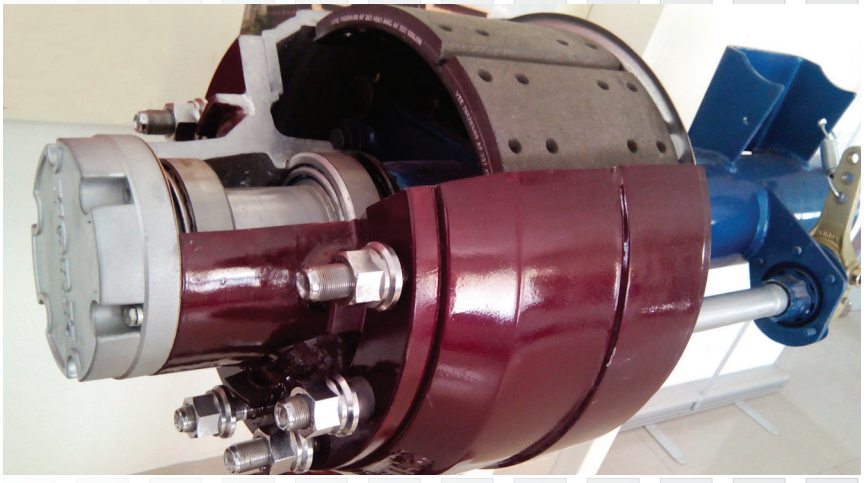


" I have been impressed with the urgency of doing.
Knowing is not enough; we must apply. Being willing is not enough; we must do."

Leonardo da Vinci

Mounting and Dismounting

- Bearing Arrangements
- Radial Location of Bearings
- Axial Location of Bearings
- Bearing Preload



BEARING HANDLING

Precautions for Proper Handing of Bearings

Since rolling bearings are high precision machine parts, they must be handled accordingly. Even if high quality bearings are used, their expected performance cannot be achieved if they are not handled properly. The main precautions to be observed are as follows:

1) Keep Bearings and Surrounding Area Clean

Dust and dirt, even if invisible to the naked eye, have harmful effects on bearings. It is necessary to prevent the entry of dust and dirt by keeping the bearings and their environment as clean as possible.

2) Careful Handling

Heavy shocks during handling may cause bearings to be scratched or otherwise damaged possibly resulting in their failure. Excessively strong impacts may cause brinelling, breaking, or cracking.

3) Use Proper Tools

Always use the proper equipment when handling bearings and avoid general purpose tools.

4) Prevent Corrosion

Since perspiration on the hands and various other contaminants may cause corrosion, keep the hands clean when handling bearings. Wear gloves if possible. Pay attention to rust of bearing caused by corrosive gasses.

Mounting

The method of mounting rolling bearings strongly affects their accuracy, life, and performance, so their mounting deserves careful attention. It is recommended that the handling procedures for bearings be fully investigated by the design engineers and that standards be established with respect to the **following items:**

1) Cleaning the bearings and related parts.
2) Checking the dimensions and finish of related parts.
3) Mounting.
4) Inspection after mounting.
5) Supply of lubricants.

Bearings should not be unpacked until immediately before mounting. When using ordinary grease lubrication, the grease should be packed in the bearings without first cleaning them. Even in the case of ordinary oil lubrication, cleaning the bearings is not required. However, bearings for high speed operation must first be cleaned with clean filtered oil in order to remove the anti-corrosion agent. After the bearings are cleaned with filtered oil, they should be protected to prevent corrosion.

Prelubricated bearings must be used without cleaning. Bearing mounting methods depend on the bearing type and type of fit. As bearings are usually used on rotating shafts, the inner rings require a tight fit.

Bearings with cylindrical bores are usually mounted by pressing them on the shafts (press fit) or heating them to expand their diameter (shrink fit). Bearings with tapered bores can be mounted directly on tapered shafts or cylindrical shafts using tapered sleeves.

Bearings are usually mounted in housings with a loose fit. However, in cases where the outer ring has an interference fit, a press may be used.

Mounting of Bearings with `Cylindrical Bores

1. Press Fits

Fitting with a press is widely used for small bearings. A mounting tool is placed on the inner ring as shown

in Fig. 14.1 and the bearing is slowly pressed on the shaft with a press until the side of the inner ring rests against the shoulder of the shaft. The mounting tool must not be placed on the outer ring for press mounting, since the bearing may be damaged. Before mounting, applying oil to the fitted shaft surface is recommended for smooth insertion.

When both the inner and outer rings of non-separable bearings, such as deep groove ball bearings, require tight-fit, a mounting tool is placed on both rings and both rings are fitted at the same time using a screw or hydraulic press. Since the outer ring of self-aligning ball bearings may deflect a mounting tool should always be used for mounting them.

In the case of separable bearings, such as cylindrical roller bearings and tapered roller bearings, the inner and outer rings may be mounted separately. Assembly of the inner and outer rings, which were previously mounted separately, should be done carefully to align the inner and outer rings correctly. Careless or forced assembly may cause scratches on the rolling contact surfaces.

2. Shrink Fits

Since press fitting large bearings requires a large force, a shrink fit is widely used. The bearings are first heated in oil expand them before mounting.

This method prevents an excessive force from being imposed on the bearings and allows mounting them in a short time.

The precautions to follow when making shrink fits are as follows:

a) Do not heat bearings to more than 120˚C.

b) Put the bearings on a wire net or suspend them in an oil tank in order to prevent them from touching the tank's bottom directly.

c) Heat the bearings to a temperature 20˚C to 30˚C higher than the lowest temperature required for mounting without interference since the inner ring will cool a little during mounting.

d) After mounting, the bearings will shrink in the axial direction as well as the radial direction while cooling. Therefore, press the bearing firmly against the shaft shoulder using locating methods to avoid a clearance between the bearing and shoulder.

In the case of relatively frequent mounting and dismounting such as cylindrical roller bearings for roll necks of rolling mills and for railway journal boxes, induction heating should be used for mounting and dismounting inner rings.

Mounting of Bearings with Tapered Bores

Bearings with tapered bores are mounted on tapered shafts directly or on cylindrical shafts with adapters or withdrawal sleeves. Large spherical rolling bearings are often mounted using hydraulic pressure.

When a large bearing is mounted on a shaft, the outer ring may be deformed into an oval shape by its own weight. If the clearance is measured at the lowest part of the deformed bearing, the measured value may be bigger than the true value.

When a self-aligning ball bearing is mounted on a shaft with an adapter, be sure that the residual clearance does not become too small. Sufficient clearance for easy alignment of the outer ring must be allowed.

Dismounting

A bearing may be removed for periodic inspection or for other reasons. If the removed bearing is to be used again or it is removed only for inspection, it should be dismounted as carefully as when it was mounted. If the bearing has a tight fit, its removal may be difficult.

Dismounting Outer Rings

In order to remove an outer ring that is tightly fitted, first place bolts in the push-out holes in the housing at several locations on its circumference and remove the outer ring by uniformly tightening the bolts. These bolt holes should always be fitted with blank plugs when not being used for dismounting.

Dismounting of Bearings with Cylindrical Bores

If the mounting design allows space to press out the inner ring, this is an easy and fast method. In this case, the withdrawal force should be imposed only on the inner ring. Withdrawal tools are often used.

The oil injection is usually used for the withdrawal of large bearings. The withdrawal is achieved easily by mean of oil pressure applied through holes in the shaft. In the case of extra wide bearings, the oil injection method is used together with a withdrawal tool.

Induction heating is used to remove the inner rings of NU and NJ types of cylindrical roller bearings. The inner rings are expanded by brief local heating and then withdrawn. Induction heating is also used to mount several bearings of these types on a shaft.

Running test of the Bearing

A running test is carried out after mounting has been completed and the free space in the bearing is filled with lubricant. When the bearing is mounted in small machine, that may be operated manually, it is to be assured by rotating the bearing smoothly. The unit where the bearing is installed is to be checked for rattling sound due to foreign matter and excessive torque caused by an inadequate clearance, mounting error or friction. It there is no abnormality observed in the performance, the machine may be started.

If the bearing is used in a large machine, which cannot be turned by hand, it can be started only by power drive. The power drive is to be started without load and examined carefully. Confirm that if there is no abnormality such as vibrations, noise, temperature rise and contact of rotating parts etc. Once again the power drive is to be started without load and the machine operation should be observed carefully until it is determined that no abnormality exists. Then gradually increase the load and speed etc. and the machine is to be checked for abnormal noise and excessive rising of temperature, leakage of grease or oil etc. If any abnormality found during checking, the machine must be stopped immediately and machine should be inspected. Generally, the bearing temperature gradually rises to the steady state level. If the bearing is mounted improperly, the bearing temperature may increase rapidly and it becomes abnormally high. The causes of rapidly increase in abnormal temperature and the countermeasures for irregularities are listed in Table.

Maintenance of Rolling Bearing

If rolling bearings are operated under ideal condition it may fail earlier than the expected life due to material fatigue, improper handling and improper application. It is therefore important to maintain the bearing so that abnormal bearing failure may be prevented or at least detected in its incoming stage. In order to keep bearing in ideal condition, it is necessary to overhaul as well as re-lubricate the bearing periodically.

1. Cleaning

On removal of bearings, they are to be inspected for appearance, record it and sent the lubricant sample for testing. The general precaution for cleaning of rolling bearing requires the following methodology:

- General light oil or kerosene without water content may be used as cleaning agent. Sometimes, chlorinated solvents may be used for cleaning.
- Dismounting bearing should be roughly washed

and rinsed separately. Each bath should be provided with metal net to support the bearing in the oil without touching the side or bottom of the tank. Do now rotate the bearing initially because foreign matter will abrade the working surface of it while rotating.

- The cleaning oil should always be kept clean by filtering and circulating it.
- If the rolling bearings are stored after cleaning, sufficient rust preventive oil should be applied to it. If the storage period is long, a high quality preventive and packing paper should be used. The rolling bearing should never be placed on the floor.

2. Inspection

During inspection of cleaned bearings the following points are to be considered.

- It should be carefully inspected to check the possibility of bearing for reuse. The inspection should include dimensional and running accuracy, internal clearance and visual checks for defects on fitting surfaces, raceway surfaces, rolling elements retainer and seals.
- The small size rolling, non-separable seal type ball bearings hold the bearing horizontally in the hand and then rotate the outer ring to confirm that it rotates smoothly.
- The determination of reuse of bearing should be left to the discretion of the person who is trained and familiar with bearings.
- The criterion for determination of reuse is dependent on the functions of machine and importance of bearing in the machine, operating conditions and the time until the next maintenance.

  If any of the following defects are found, the reuse of the bearing is not advised.

  Hence the replacement is necessary.

- If any cracks developed in inner ring or outer ring, rolling elements or retainer.
- When there is flaking on the raceway or rolling elements.
- When there is any significant smearing on raceway surface, ribs or rolling elements.
- When the cage is worn out or rivets are loose.
- When there is rust on raceways.
- When there is significant impact on the raceway or rolling surfaces.
- When there is a significant creep on bearing bore or on periphery of the outer ring.
- When there is any discoloration of bearing component by heat.
- When any significant damage of seal or shield.

Possible causes and countermeasures of irregularities

Irregularities	Possible Causes	Countermeasures
Metallic sound	Abnormal load Incorrect mounting Insufficient or improper lubricant Contact of rotating parts	Improve the fit, Internal clearance, Pre-load, position of housing shoulder etc. Improve the machining accuracy and alignment of shaft and housing accuracy of mounting method. Replace the lubricant or select another lubricant. Modify the labyrinth
Regular sound	Corrosion or scratches on raceways Brinelling Flaking on race ways	Replace or clean the bearing, improve the seals and use clean lubricant. Replace the bearing and take care when handling Replace the bearing.
Irregular sound	Excessive clearance Penetration of foreign particles Flaking on rolling element	Improve the fit, clearance and preload Replace or clean the bearing, improve the seals, and use clean lubricant. Replace the bearing
Abnormal temperature rise	Excessive amount of lubricant Insufficient or improper lubricant Abnormal Load Incorrect mounting Creep on fitted surface, excessive seal friction	Reduce the amount of lubricant. Select stiffer grease. Replenish lubricant or select the better one. Improve the fit, internal clearance, preload, position of housing shoulder. Improve the machining accuracy and alignment of shaft and housing, accuracy of mounting, or mounting method. Correct the seal, replace the bearing, correct the fitting or mounting.
Vibration (Axial run out)	Brinelling Flaking Incorrect mounting Penetration of foreign particles.	Replace the bearing and take care while holding the bearing Replace the bearing Correct the squareness between the shaft and housing shoulder or side of spacer Replace or clean the bearing, improve the seal.
Leakage or discoloration of lubricant	Too much lubricant, penetration by foreign matter or abrasion chips	Reduce the amount of lubricant. Select stiffer grease. Replace the bearing or lubricant. Clean the housing or adjacent parts.

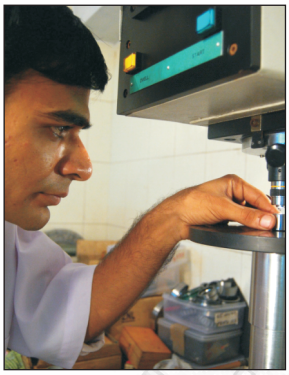
Reference Standards Used by ZNL

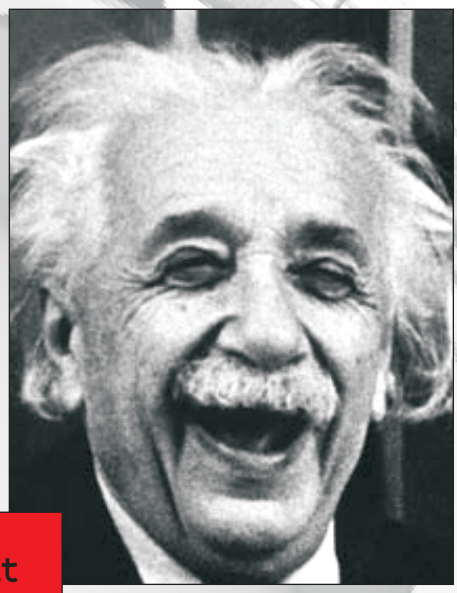
Reference Standard used by ZNL

Standard Number	Standard Title
IS 2398 : 1967	Identification Code for Rolling Bearings
IS 2399 : 1988	Rolling bearings - Vocabulary
IS 2898 : 1976	Specification for Steel Balls for Rolling Bearings
IS 3090 : 1965	Code of practice for installation and maintenance of rolling bearings
IS 3823 : 1988	Rolling bearings - Static load ratings
IS 3824 : 2002	Rolling Bearings - Dynamic Load Ratings and Rating Life
IS 3824 : Part 1 : 1983	Methods of evaluating dynamic load ratings of rolling bearings Part 1 Radial ball bearings
IS 3824 : Part 2 : 1983	Methods of evaluating dynamic load ratings of rolling bearings Part 2 Radial roller bearings
IS 3824 : Part 3 : 1983	Methods of evaluating dynamic load ratings of rolling bearings Part 3 Thrust ball bearings
IS 3824 : Part 4 : 1983	Methods of evaluating dynamic load ratings of rolling bearings Part 4 Thrust roller bearings
IS 3980 : 1982	Specification for Porous Metal Powder Oil-Impregnated Bearings
IS 4025 : 1983	Gauging practice for rolling bearings
IS 4215 : 1983	Specification for Ring Type Needle Bearings
IS 4773 : 2002	Rolling Bearings -- Plummer Blocks Housings -- Boundary Dimensions
IS 4774 : Part II : 1982	Specification for Thin-walled Half Bearings - Part II : Flanged Bearing
IS 5669 : 1987	General plan of boundary dimensions for radial rolling bearings
IS 5692 : 1988	Tolerances for radial rolling bearings
IS 5932 : 1970	Boundary Dimensions for Thrust Ball Bearings with Flat Seats
IS 5933 : 2002	Rolling Bearings - Thrust Bearings - Tolerances
IS 5934 : 1999	Rolling Bearings - Chamfer Dimensions - Maximum Values - Specification
IS 5935 : 1992	Radial internal clearances in unloaded radial rolling bearings
IS 6453 : 1984	Technical supply conditions for rolling bearings
IS 6454 : 1972	Specification for Self-Aligning Roller Bearings
IS 6455 : 1972	Specification for Single Row Radial Ball Bearings
IS 6456 : 1972	Specification for Double Row Radial Ball Bearings
IS 6457 : 1972	Specification for Single Row Cylindrical Roller Bearings
IS 6458 : 1972	Specification for Double Row Cylindrical Roller Bearings
IS 6548 : 1992	Rolling bearings - Instrument precision bearings
IS 6731 : 1977	Specification for Locknuts, Narrow Series and Lockwashers with Straight Inner Tab for Rolling Bearings
IS 6751 : 1972	Specification for Aluminium Alloy Castings and Strips for Bearings
IS 6754 : 1972	Specification for Aluminium Alloy Ingots for Bearings
IS 7460 : 1988	Tolerances for tapered roller bearings
IS 7461 : Part 1 : 1993	General plan of boundary dimensions for tapered roller bearings Part 1 Single row bearings
IS 7461 : Part 2 : 1992	General plan of boundary dimensions for tapered roller bearings Part 2 Double row bearings
IS 7461 : Part 3 : 1992	General plan of boundary dimensions for tapered roller bearings Part 3 Flanged cups
IS 8656 : 1977	Specification for Tapered Adapter Sleeves for Rolling Bearings
IS 8657 : 1977	Specification for Tapered Withdrawal Sleeves for Rolling Bearings
IS 9619 : 1980	Identification code for shell type needle bearings (including sealed bearings)
IS 9764 : Part 1 : 1992	Plain bearings - Washers for plain bearings and wrapped bushes - Specification Part 1 Ring type thrust washers

Reference Standard used by ZNL

Standard Number	Standard Title
IS 9764 : Part 2 : 1994	Plain bearings - Washers for plain bearings and wrapped bushes -Specification Part 2 Half thrust washers
IS 10203 : 1982	Technical supply conditions for thin walled plain bearings
IS 10260 : Part I : 1982	Terms, definitions and classification of plain bearings Part I Construction
IS 10260 : Part II : 1982	Terms, definitions and classification of plain bearings Part II Friction and wear
IS 10260 : Part III : 1982	Terms, definitions and classification of plain bearings Part III Lubrication
IS 10385 : 1982	Method for determination of radial crushing strength of sintered metal powder bearings
IS 10648 : 1983	Code for identification of ring type needle bearings (including sealed bearings)
IS 11027 : 1984	Definitions of tolerances for rolling bearings
IS 11145 : 2002	Plain Bearings -- Thin Walled Half-Bearings -- Checking of Peripheral Length
IS 11159 : Part 3 : 1989	General classification of lubricants, industrial oils and related products (Part 3) Family F (Spindle bearings, bearings and associated clutches)
IS 11430 : 1985	Code of practice for the packaging of ball and roller bearings
IS 11904 : 1999	Rolling bearings with locating Radial bearings snap ring - Dimensions and tolerances - Specification
IS 12102 : 1987	Specification for Tapered Roller Bearings
IS 13405 : 1999	Rolling Bearings - Cylindrical Roller Bearings, Separate Thrust Collars - Boundary Dimensions - Specification
IS 13406 : 1992	Radial ball bearings with flanged outer ring - Flange dimensions
IS 13637 : Part 1 : 1993	Technical Drawings - Rolling Bearings - Part 1 : General Simplified Representation
IS 13637 : Part 2 : 1999	Technical Drawings - Rolling Bearings - Part 2 : Detailed Simplified Representation
IS 13962 : 1994	Rolling bearings - Metric tapered roller bearings - Designation system
IS 14478 : 1997	Plain Bearings - Thick-walled dushes, Plain and Flange Type, Full Round (Without Any Joint or Slit) - Specification
IS 14691 : 1999	Rolling Bearings - Taper Rolling Bearings - Tapered Roller - Metric Series - Specification
IS 14802 : Part 1 : 2000	Plain Bearings - Hardness Testing of Bearing Metals - Part 1 : Compound Materials
IS 14802 : Part 2 : 2000	Plain Bearings - Hardness Testing of Bearing Metals - Part 2 : Solid Materials
IS 14803 : Part 1 : 2000	Plain Bearings - Part 1 : Fits
IS 14803 : Part 2 : 2000	Plain Bearings - Part 2 : Tolerances on Form and Position and Surface Roughness for Shafts, Flanges and Thrust Collars





"Scientists investigate that which already is, Engineers create that which has never been!."

Albert Einstein

Deep Groove
Ball Bearings

Deep groove ball bearings

Deep Groove Ball Bearing

These types of bearing contains of inner ring. Outer ring, ball and cage. Also available in rubber seals and steel shields, snap ring grooves with snap-rings and also in different types of cage.

These bearings are mainly

Single row deep groove ball bearings

Double row deep groove ball bearings

Characteristic of deep groove ball bearing

Low, medium and very high speed rotation

Require low maintenance

Able to accommodate axial load in both direction

Able to accommodate radial load at high speed

Unidirectional and bidirectional load carrying capacity

Good running accuracy and low noise

Use for low and medium load application

Series available

For Single Row

6800, 6900, 16000, 6000, 6200, 6300, 6400, 62000, 62300, 63000, 61800, 61900,

6200, 6300, - Also manufacture in EMQ [Electric Motor Quality]

For Double Row

4200, 4300

Double row deep groove ball bearing has

Deep interrupted raceways and high conformity between ball and raceways.

Carry axial load in unidirectional and bidirectional, addition to radial load. Suitable where load carrying capacity of single row deep groove ball bearing is inadequate.

Double row deep groove ball bearing are wider than single row deep groove ball bearing for same bore diameter and outer diameter, ball have higher load carrying capacity than

single row deep groove ball bearing.

Precautions for use of Deep Groove Ball Bearing

If the bearing load is too small during operation slippage occurs between the ball raceway. Which may result in smearing in deep Groove ball bearing. The higher the weight of ball and cage, the higher the foundry becomes, specially for large bearings. So if very Small bearing load are expected than please contact ZNL for selection of appropriate bearings

Misalignment

For double row deep groove ball bearing misalignment of inner ring relative to outer ring can only accommodate by force, which results ball load and cage force and result in reduce bearing life. Any misalignment in bearing ring will result increase noise during application.

ZNL Offering

All type of ball bearing

With Z, 2Z shield and with Rubber seal RS, 2RS

With snap ring groove and snap ring

For redial clearance C2, CN, C3, C4, C5

As per ISO grade PO ABEC1 And as per ISO Grade P6 ABEC3

Cage type riveted of steel and brass steel, machined brass cage, polyimide.

Dimension as per ISO standard, DIN standard and ISI standard.

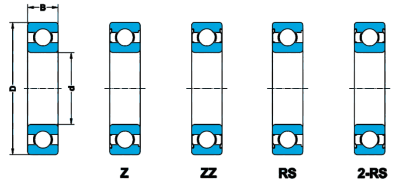
RLS, RMS, XLJ Available

Radial internal clearance of Deep groove ball bearings

Bore		Radial internal clearance									
Diameter d over	Incl	C2 min	Max	Normal Min	Max	C3 Min	Max	C4 Min	Max	C5 Min	Max
mm		Mincron									
	6	0	7	2	13	8	23	-	-	-	-
6	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	8	28	23	43	38	61	55	90
65	80	1	15	10	30	25	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	4	32	28	82	73	132	120	187	175	255
225	250	4	36	31	92	87	152	140	217	205	290
250	280	4	39	36	97	97	162	152	237	255	320

Deep groove ball bearings

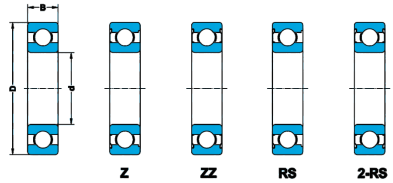
Single row
d10 -25mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0				
mm			kN		RPM		kg	
10	19	5	1.38	0.58	36000	43000	0.0055	61800
	22	6	1.95	0.75	34000	40000	0.010	61900
	26	8	4.62	1.96	30000	36000	0.019	6000
	28	8	4.62	1.96	28000	34000	0.022	16100
	30	9	5.07	2.36	24000	30000	0.032	6200
	35	11	8.06	5.40	20000	26000	0.053	6300
12	21	5	1.43	0.67	32000	38000	0.0063	61801
	24	6	2.25	0.98	30000	36000	0.011	61901
	28	8	5.07	2.36	26000	32000	0.022	6001
	30	8	5.07	2.36	26000	32000	0.023	16101
	32	10	6.89	3.10	22000	28000	0.037	6201
	37	12	9.75	4.15	19000	24000	0.060	6301
15	24	5	1.56	0.8	28000	34000	0.0074	61802
	28	7	4.03	2.04	24000	30000	0.016	61902
	32	8	5.59	2.85	22000	28000	0.025	16002
	32	9	5.59	2.85	22000	28000	0.030	6002
	35	11	7.80	3.75	19000	24000	0.045	6202
	42	13	11.40	5.40	17000	20000	0.052	6302
17	26	5	1.68	0.93	24000	30000	0.0082	61803
	30	7	4.36	2.32	22000	28000	0.018	61903
	35	10	6.05	3.25	19000	24000	0.039	6003
	40	12	9.56	4.75	17000	20000	0.065	6203
	47	14	13.50	6.55	16000	19000	0.12	6303
	62	17	22.90	10.80	12000	15000	0.27	6403
20	32	7	2.70	1.50	19000	24000	0.018	61804
	37	9	6.37	3.65	18000	22000	0.038	61904
	42	8	6.89	4.05	17000	20000	0.050	16004
	42	12	9.36	5.00	17000	20000	0.069	6004
	47	14	12.70	6.55	15000	18000	0.11	6204
	52	15	15.90	7.80	13000	16000	0.14	6304
	72	19	30.70	15.0	10000	13000	0.40	6404
25	37	7	4.36	2.60	17000	20000	0.022	61805
	42	9	6.63	4.00	16000	19000	0.045	61905
	47	8	7.61	4.75	14000	17000	0.06	16005
	47	12	11.20	6.55	15000	18000	0.08	6005
	52	15	14.00	7.80	12000	15000	0.13	6205

Deep groove ball bearings

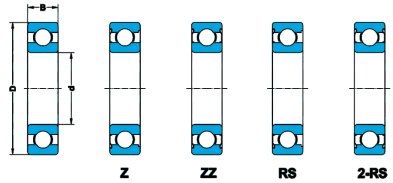
Single row
d25 - 50mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0				
mm			kN		RPM		kg	
25	62	17	22.50	11.60	11000	14000	0.23	6305
	80	21	35.80	19.30	9000	11000	0.53	6405
30	42	7	4.49	2.90	15000	18000	0.027	61806
	47	9	7.28	4.55	14000	17000	0.051	61906
	55	9	11.20	7.35	12000	15000	0.085	16006
	62	16	19.50	11.20	10000	13000	0.20	6206
	72	19	28.10	16.00	9000	11000	0.35	6306
	90	23	43.60	23.6	8500	10000	0.74	6406
35	47	7	4.75	3.20	13000	16000	0.030	61807
	55	10	9.56	6.20	11000	14000	0.080	61907
	55	13	13.30	8.30	12000	15000	0.12	6006
	62	9	12.40	8.15	11000	13000	0.11	16007
	62	14	15.90	10.20	10000	13000	0.16	6007
	72	17	25.50	15.30	9000	11000	0.29	6207
	80	21	33.20	19.00	8500	10000	0.46	6307
	100	25	55.30	31.00	7000	8500	0.95	6407
40	52	7	4.94	3.45	11000	14000	0.034	61808
	62	12	13.80	9.30	10000	13000	0.12	61908
	68	9	13.30	9.15	9500	12000	0.13	16008
	68	15	16.80	11.60	9500	12000	0.19	6008
	80	18	30.70	19.00	8500	10000	0.37	6208
	90	23	41.00	24.00	7500	9000	0.63	6308
	110	27	63.70	36.50	6700	8000	1.25	6408
45	58	7	6.05	4.3	9500	12000	0.040	61809
	68	12	14.0	10.8	9000	11000	0.14	61909
	75	10	15.6	10.8	9000	11000	0.17	16009
	75	16	20.8	14.6	9000	11000	0.25	6009
	85	19	33.2	21.6	7500	9000	0.41	6209
	100	25	52.7	31.5	6700	8000	0.83	6309
	120	29	76.1	45.0	6000	7000	1.55	6409
50	65	7	6.24	4.75	9000	11000	0.052	61810
	72	12	14.6	10.4	8500	10000	0.140	61910
	80	10	16.3	11.4	8500	10000	0.18	16010
	80	16	21.6	16.0	8500	10000	0.26	6010
	90	20	35.1	23.2	7000	8500	0.46	6210
	110	27	61.8	38.0	6300	7500	1.05	6310

Deep groove ball bearings

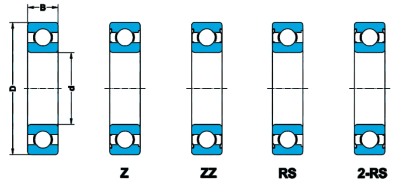
Single row
d50 - 75mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0				
mm			kN		RPM		kg	
50	130	31	87.1	52.0	5300	6300	1.90	6410
55	72	9	8.84	6.8	8500	10000	0.083	61811
	80	13	15.9	11.4	8000	9500	0.19	61911
	90	11	19.5	14.0	7500	9000	0.26	16011
	90	18	28.1	21.2	7500	9000	0.39	6011
	100	21	43.6	29.0	6300	7500	0.61	6211
	120	29	43.6	29.0	6300	7500	0.61	6311
	140	33	99.5	62.0	5000	6000	2.3	6411
60	78	10	8.71	6.70	7500	9000	0.11	61812
	85	13	16.5	12.00	7500	9000	0.20	61912
	95	11	19.9	15.00	6700	8000	0.28	16012
	95	18	29.6	23.2	6700	8000	0.42	6012
	110	22	52.7	36.00	6000	7000	0.78	6212
	130	31	81.9	52.00	5000	6000	1.70	6312
	150	35	10.8	69.50	4800	5600	2.75	6412
65	85	10	11.9	9.65	7000	8500	0.13	61813
	90	13	17.4	13.40	6700	8000	0.22	61913
	100	11	21.2	16.6	6300	7500	0.30	16013
	100	18	21.2	16.6	6300	7500	0.30	6013
	120	23	55.9	40.5	5300	6300	0.99	6213
	140	33	92.3	60.0	4800	5600	2.10	6313
	160	37	119.0	78.0	4500	5300	3.30	6413
70	90	10	12.1	10.0	6700	8000	0.14	61814
	100	16	23.8	18.3	6300	7500	0.35	61914
	110	13	28.1	25	6000	7000	0.43	16014
	110	20	37.7	31.0	6000	7000	0.60	6014
	125	24	60.5	45	5000	6000	1.05	6214
	150	35	104.0	68.0	4500	5300	2.50	6314
	180	42	143.0	104.0	3800	4500	4.85	6414
75	95	10	12.50	10.80	6300	7500	0.15	61815
	105	16	24.20	19.30	6000	7000	0.370	61915
	115	13	28.60	27	5600	6700	0.46	16015
	115	20	39.70	33.5	5600	6700	0.64	6015
	130	25	66.30	49.00	4800	5600	1.2	6215
	160	37	114.00	76.50	4300	5000	3	6315
	190	45	153.00	114.00	3600	4300	6.8	6415

Deep groove ball bearings

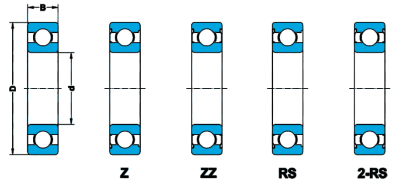
Single row
d80 - 100mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0				
mm			kN		RPM		kg	
80	100	10	12.70	11.20	6000	7000	0.15	61816
	110	16	25.10	20.4	5600	6700	0.40	61916
	125	14	33.20	31.5	5300	6300	0.60	16016
	125	22	47.50	40.00	5300	6300	0.85	6016
	140	26	70.20	55.00	4500	5300	1.40	6216
	170	39	124.00	86.5	3800	4500	3.60	6316
	200	48	163.00	125	3400	4000	8.00	6416
85	110	13	19.50	16.60	5300	6300	0.27	61817
	120	18	31.90	30.00	5300	6300	0.55	61917
	130	14	33.80	33.50	5000	6000	0.63	16017
	130	22	49.40	43	5000	6000	0.89	6017
	150	28	83.20	64.00	4300	5000	1.80	6217
	180	41	133.00	96.50	3600	4300	4.25	6317
	210	52	174.00	137.00	3200	3800	9.5	6417
90	115	13	19.50	17	5300	6300	0.28	61818
	125	18	33.20	31.50	5000	6000	0.59	61918
	140	16	41.60	39	4800	5600	0.85	16018
	140	24	58.50	50.00	4800	5600	1.15	6018
	160	30	95.60	73.50	3800	4500	2.15	6218
	190	43	143.00	108.00	3400	4000	4.90	6318
	225	54	186.00	15.00	3000	3600	11.5	6418
95	120	13	19.90	17.6	5000	6000	0.30	61819
	130	18	33.8	33.5	4800	5600	0.61	61919
	145	16	42.3	41.5	4500	5300	0.89	16019
	145	24	60.5	5.4	4500	5300	1.20	6019
	170	32	108.0	81.5	3600	4300	2.60	6219
	200	45	153.0	118.0	3200	3800	5.65	6319
100	125	13	19.90	18.3	4800	5600	0.310	61820
	140	20	42.3	41.5	4500	5300	0.83	61920
	150	16	44.2	44	4300	5000	0.91	16020
	150	24	60.5	54.0	4300	5000	1.25	6020
	180	34	124.0	93	3400	4000	3.158	6220
	215	47	174.0	140.0	3000	3600	7.00	6320

Deep groove ball bearings

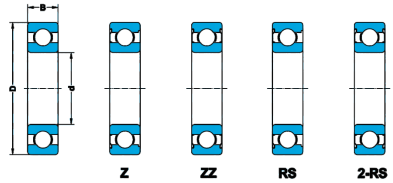
Single row
d105 - 150mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0				
mm			kN		RPM		kg	
105	130	13	20.80	19.60	4500	5300	0.32	61821
	145	20	44.20	44.00	4300	5000	0.87	61921
	160	18	52.00	51	4000	4800	1.20	16021
	160	26	72.80	65.5	4000	4800	1.60	6021
	190	36	133.00	104.00	3200	3800	3.70	6221
	225	49	182.00	153.00	2800	3400	8.25	6321
110	140	16	28.10	26.00	4300	5000	0.60	61822
	150	20	43.60	45	4000	4800	0.90	61922
	170	19	57.20	57	3800	4500	1.45	16022
	170	28	81.90	73.50	3800	4500	1.95	6022
	200	38	143.00	118.00	3000	3600	4.35	6222
	240	50	203.00	180	2600	3200	9.55	6322
120	150	16	29.10	28.00	3800	4500	0.65	61824
	165	22	55.30	57.00	3600	4300	1.20	61924
	180	19	60.50	64.00	3400	4000	1.60	16024
	180	28	85.20	80	3400	4000	2.05	6024
	215	40	146.00	118.00	2800	3400	5.15	6224
	260	55	208.00	186.00	2400	3000	14.5	6324 M
130	165	18	37.70	43	3600	4300	0.93	61826
	180	24	65.00	670.00	3400	4000	1.60	61926
	200	22	79.30	81.5	3200	3800	2.35	16026
	200	33	106.0	100.00	3200	3800	3.15	6026
	230	40	156.0	132.00	2600	3200	5.80	6226
	280	58	229.0	216.00	2200	2800	18.0	6326 M
140	175	18	39.00	46.5	3400	4000	0.99	61828
	190	24	66.3	72.0	3200	3800	1.70	61928
	210	22	80.6	86.5	3000	3600	2.50	16028
	210	33	111.0	108.0	3000	3600	3.35	6028
	250	42	165.0	150	2400	3000	7.45	6228
	300	62	251.0	245.0	2000	2600	22.0	6328 M
150	190	20	48.800	61.0	3000	3600	1.40	61830
	210	28	88.400	93.0	2800	3400	3.05	61930
	225	24	92.300	98	2600	3200	3.15	16030
	225	35	125.000	125.0	2600	3200	4.80	6030
	270	45	174.000	166	2000	2600	9.40	6230
	320	65	276.000	285.0	1900	2400	26.0	6330 M

Deep groove ball bearings

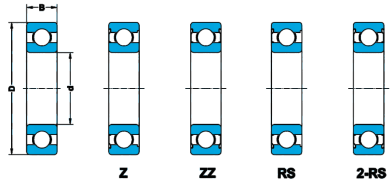
Single row
d160 - 220mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0				
mm			kN		RPM		kg	
160	200	20	49.400	64.00	2800	3400	1.45	61832
	220	28	92.300	98.00	2600	3200	3.25	61932
	240	25	99.500	108	2400	3000	3.7	16032
	240	38	143.000	143	2400	3000	5.9	6032
	290	48	186.000	186.00	1900	2400	14.5	6232
	340	68	276.000	28.50	1800	2200	29	6332 M
170	215	22	61.800	78.00	2600	3200	1.9	61834
	230	28	93.600	106	2400	3000	3.4	61934
	260	28	119.000	129	2200	2800	5	16034
	260	42	168.000	173.00	2200	2800	7.90	6034 M
	310	52	212.000	224.00	1900	2400	17.5	6234 M
	360	72	312.000	340	1700	2000	34.5	6334 M
180	225	22	62.400	81.50	2400	3000	2.00	61836
	250	33	119.000	134.00	2200	2800	5.050	61936
	280	31	138.000	146.00	2000	2600	6.6	16036
	280	46	190.000	200	2000	2600	10.50	6036 M
	320	52	229.000	24.00	1800	2200	18.5	6236 M
	380	75	351.000	405.00	1700	2000	42.5	6336 M
190	240	24	76.1	98	2200	2800	2.60	61838
	260	33	117.0	134.00	2200	2800	5.25	61938
	290	31	148.0	16	2000	2600	7.90	16038
	290	46	195.0	216.00	2000	2600	11.0	6038 M
	340	55	255.0	280.00	1700	2000	23.0	6238 M
	400	78	371.0	430.00	1600	1900	49.0	6338 M
200	250	24	76.1	102.0	2200	2800	2.70	61840 M
	280	38	148.0	166.0	2000	2600	7.40	61940 M
	310	34	168.0	190	1900	2400	8.85	16040 M
	310	51	216.0	245.0	1900	2400	14.0	6040 M
	360	58	270.0	310	1700	2000	28.0	6240 M
	420	80	377.0	465.0	1500	1800	55.5	6340 M
220	270	24	78.00	110.0	1900	2400	3.00	61844 M
	300	38	151.0	180.0	1900	2400	8.00	61944 M
	340	37	174.0	204.0	1800	2200	11.5	16044 M
	340	56	247.0	290.0	1800	2200	18.5	6044 M
	400	65	296.0	365.0	1500	1800	37.0	6244 M
	460	88	410.0	520.0	1300	1600	72.5	6344 M

Deep groove ball bearings

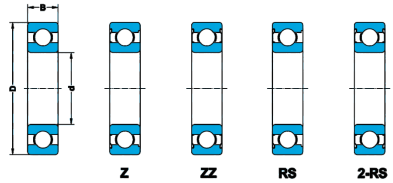
Single row
d240 - 380mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0				
mm			kN		RPM		kg	
240	300	28	108.0	150.0	1800	2200	4.50	61848 M
	320	38	159.0	200.0	1800	2200	8.60	61048 M
	360	37	178.0	220.0	1700	2000	14.5	16048 M
	360	56	255.0	315.0	1700	2000	19.5	6048 M
	440	72	358.0	475.0	1300	1600	51.0	6048 M
260	320	28	111.0	163.0	1700	2000	4.80	61852 M
	360	46	212.0	270.0	1600	1900	14.5	61952 M
	400	44	238.0	310.0	1500	1800	21.5	16052 M
	400	65	291.0	375.0	1500	1800	29.5	6052 M
	480	80	390.0	530.0	1100	1400	65.5	6252 M
280	350	33	138.000	200.0	1600	1900	7.40	61856 M
	380	46	216.0	285.0	1500	1800	15.5	61956 M
	420	44	242.0	335.0	1400	1700	23.0	16056 M
	420	65	302.0	405.0	1400	1700	31.0	6056 M
	500	80	423.0	600.0	1100	1400	71.0	6256 M
300	380	38	172	245	2600	3200	10.5	61860 MA
	420	56	270	375	2400	3000	24.5	61960 MA
	460	50	286	405	2400	2800	32.0	16060 MA
	460	74	358	500	2400	2800	44.0	6060 M
	540	85	462	670	2000	2400	88.5	6260 M
320	400	38	172	255	2400	3000	11.0	61864 MA
	440	56	276	400	2400	2800	25.5	61964 MA
	480	50	281	405	2200	2600	34.0	16064 MA
	480	74	371	540	2200	2600	46.0	6064 M
340	420	38	178	275	2400	2800	11.5	61868 MA
	460	56	281	425	2200	2600	26.5	61968 MA
	520	57	345	520	2000	2400	45.0	16068 MA
	520	82	423	640	2000	2400	62.0	6068 M
360	440	38	182	285	2200	2600	12.0	61872 MA
	480	56	291	450	2000	2600	28.0	61972 MA
	540	57	351	550	1900	2400	49.0	16072 MA
	540	82	462	735	1900	2400	64.5	6072 M
380	480	46	242	390	2000	2400	20.0	61876 MA
	520	65	338	540	1900	2400	40.0	61976 MA
	560	57	377	620	1800	2200	51.0	16076 MA
	560	82	462	750	1800	2200	67.5	6076 M

Deep groove ball bearings

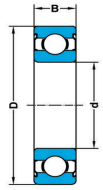
Single row
d400 - 500mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0				
mm			kN		RPM		kg	
400	500	46	247	405	1900	2400	20.5	61880 MA
	540	65	345	570	1800	2200	41.5	61980 MA
	600	90	520	865	1700	2000	87.5	6080 M
420	520	46	251	425	1800	2200	21.5	61884 MA
	560	65	351	600	1800	2200	43.0	61984 MA
	620	90	507	880	1600	2000	91.5	6084 M
440	540	46	255	440	1800	2200	22,5	61888 MA
	600	74	410	720	1600	2000	60,5	61988 MA
	650	94	553	965	1500	1900	105	6088 M
460	580	56	319	570	1600	2000	35,0	61892 MA
	620	72	423	750	1600	1900	62,5	61992 MA
	680	100	582	1060	1500	1800	120	6092 MB
480	600	56	325	600	1600	1900	36,5	61896 MA
	650	78	449	815	1500	1800	74,0	61996 MA
	700	100	618	1140	1400	1700	125	6096 MB
500	620	56	332	620	1500	1800	40,5	618/500 MA
	670	78	462	865	1400	1700	77,0	619/500 MA
	720	100	605	1140	1300	1600	135	60/500 N1MAS

Sealed Single Row Deep groove ball bearings

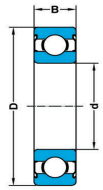
d10 - 15mm



Principal Dimensions			Basic Load ratings		Speed Ratings Lubrication	Mass	Designation
			Dynamic	Static	Grease		
d	D	B	C	C_0			
mm			kN		RPM	kg	
10	19	5	1.38	0.59	32000	0.0055	61800-2Z
	19	5	1.38	0.59	32000	0.0055	61800-2RS
	22	6	2.08	0.85	30000	0.010	61900-2Z
	22	6	2.08	0.85	30000	0.010	61900-2RS
	26	8	4.75	1.96	27000	0.019	6000-2Z
	26	8	4.75	1.96	27000	0.019	6000-2RS
	26	12	4.62	1.96	27000	0.025	63000-2RS
	30	9	5.40	2.36	22000	0.032	6200-2Z
	30	9	5.40	2.36	22000	0.032	6200-2RS
	30	14	5.07	2.36	22000	0.04	62200-2RS
	35	11	8.52	3.4	20000	0.053	6300-2Z
	35	11	8.52	3.4	20000	0.053	6300-2RS
	35	17	8.06	3.4	20000	0.06	62300-2RS
12	21	5	1.43	0.67	28000	0.0063	61801-2Z
	21	5	1.43	0.67	28000	0.0063	61801-2RS
	24	6	2.25	0.98	27000	0.011	61901-2Z
	24	6	2.25	0.98	27000	0.011	61901-2RS
	28	8	5.4	2.36	24000	0.022	6001-2Z
	28	8	5.4	2.36	24000	0.022	6001-2RS
	28	12	5.07	2.36	24000	0.029	63001-2RS
	32	10	7.28	3.1	20000	0.037	6201-2Z
	32	10	7.28	3.1	20000	0.037	6201-2RS
	32	14	6.89	3.1	20000	0.045	62201-2RS
	37	12	10.1	4.15	18000	0.060	6301-2Z
	37	12	10.1	4.15	18000	0.060	6301-2RS
	37	17	9.75	4.15	18000	0.070	62301-2RS
15	24	5	1.56	0.8	24000	0.0074	61802-2Z
	24	5	1.56	0.8	24000	0.0074	61802-2RS
	28	7	4.36	2.24	22000	0.016	61902-2Z
	28	7	4.36	2.24	22000	0.016	61902-2RS
	32	8	5.85	2.85	20000	0.025	16002-2Z
	32	9	5.85	2.85	20000	0.030	6002-2Z
	32	9	5.85	2.85	20000	0.030	6002-2RS
	32	13	5.59	2.85	20000	0.039	63002-2RS
	35	11	8.06	3.75	17000	0.045	6202-2Z

Sealed Single Row Deep groove ball bearings

d15 -25mm



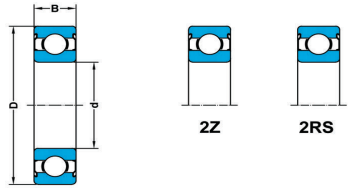
2Z

2RS

Principal Dimensions			Basic Load ratings		Speed Ratings Lubrication	Mass	Designation
			Dynamic	Static	Grease		
d	D	B	C	C_0			
mm			kN		RPM	kg	
15	35	11	8.06	3.75	17000	0.045	6202-2RS
	35	14	7.8	3.75	17000	0.054	62202-2RS
	42	13	11.9	5.4	15000	0.082	6302-2Z
	42	13	11.9	5.4	15000	0.082	6302-2RS
	42	17	11.4	5.40	15000	0.11	62302-2RS
17	26	5	1.68	0.93	22000	0.0082	61803-2Z
	26	5	1.68	0.93	22000	0.0082	61803-2RS
	30	7	4.62	2.55	20000	0.018	61903-2Z
	30	7	4.62	2.55	20000	0.018	61903-2RS
	35	8	6.37	3.25	18000	0.032	16003-2Z
	35	10	6.37	3.25	18000	0.039	6003-2Z
	35	10	6.37	3.25	18000	0.039	6003-2RS
	35	14	6.05	3.25	18000	0.052	63003-2RS
	40	12	9.95	4.75	15000	0.065	6203-2Z
	40	12	9.95	4.75	15000	0.065	6203-2RS
	40	16	9.56	4.75	15000	0.083	62203-2RS
	47	14	14.3	6.55	13600	0.12	6303-2Z
	47	14	14.3	6.55	13600	0.12	6303-2RS
	47	19	13.5	6.55	13600	0.15	62303-2RS
20	32	7	4.03	2.32	18000	0.018	61804-2RS
	37	9	6.37	3.65	17000	0.038	61904-2RS
	42	12	9.95	5	15000	0.069	6004-2Z
	42	12	9.95	5	15000	0.069	6004-2RS
	42	16	9.36	5	15000	0.086	63004-2RS
	47	14	13.5	6.55	13000	0.11	6204-2Z
	47	14	13.5	6.55	13000	0.11	6204-2RS
	47	18	12.7	6.55	13000	0.13	62204-2RS
	52	15	16.8	7.8	12000	0.14	6304-2Z
	52	15	16.8	7.8	12000	0.14	6304-2RS
	52	21	15.9	7.8	12000	0.20	62304-2RS
25	37	7	4.36	2.6	15000	0.022	61805-2RS
	42	9	7.02	4.3	14000	0.045	61905-2RS
	47	12	11.9	6.55	13000	0.08	6005-2Z
	47	12	11.9	6.55	13000	0.08	6005-2RS
	47	16	11.2	6.55	13000	0.10	63005-2RS

Sealed Single Row Deep groove ball bearings

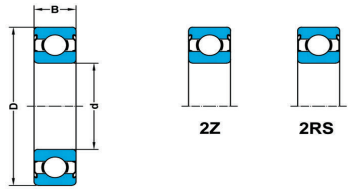
d25 - 45mm



Principal Dimensions			Basic Load ratings		Speed Ratings Lubrication	Mass	Designation
			Dynamic	Static	Grease		
d	D	B	C	C_0			
mm			kN		RPM	kg	
25	52	15	14.8	7.80	11000	0.13	6205-2Z
	52	15	14.8	7.80	11000	0.13	6205-2RS
	52	18	14.0	7.80	11000	0.15	62205-2RS
	62	17	23.4	11.60	9000	0.23	6305-2Z
	62	17	23.4	11.60	9000	0.23	6305-2RS
	62	24	22.5	11.6	9000	0.32	62305-2RS
30	42	7	4.49	2.9	13000	0.027	61806-2Z
	47	9	7.28	4.55	12000	0.051	60906-2RS
	55	13	13.8	8.3	11000	0.12	6006-2Z
	55	13	13.8	8.3	11000	0.12	6006-2RS
	55	19	13.3	8.3	11000	0.16	63006-2RS
	62	16	20.3	11.2	9000	0.20	6206-2Z
	62	16	20.3	11.2	9000	0.20	6206-2RS
	62	20	19.5	11.2	9000	0.24	62206-2RS
	72	19	29.6	16	8000	0.35	6306-2Z
	72	19	29.6	16	8000	0.35	6306-2RS
	72	27	28.1	16	8000	0.48	62306-2RS
35	47	7	4.75	3.2	11000	0.03	61807-2RS
	55	10	9.56	6.8	10000	0.08	61907-2RS
	62	14	16.8	10.2	9000	0.16	6007-2Z
	62	14	16.8	10.2	9000	0.16	6007-2RS
	62	20	15.9	10.2	9000	0.21	63007-2RS
	72	17	27	15.3	8000	0.29	6207-2Z
	72	17	27	15.3	8000	0.29	6207-2RS
	72	23	25.5	15.3	8000	0.37	62207-2RS
	80	21	35.1	19	7000	0.46	6307-2Z
	80	21	35.1	19	7000	0.46	6307-2RS
	80	31	33.2	19	7000	0.66	62307-2RS
40	52	7	4.94	3.45	10000	0.034	61808-2RS
	62	12	13.8	10	9000	0.12	61908-2RS
	68	15	17.8	11.6	8000	0.19	6008-2Z
	68	15	17.8	11.6	8000	0.19	6008-2RS
	68	21	16.8	11.6	8000	0.26	63008-2RS
	80	18	32.5	19	7000	0.37	6208-2Z
	80	18	32.5	19	7000	0.37	6208-2RS

Sealed Single Row Deep groove ball bearings

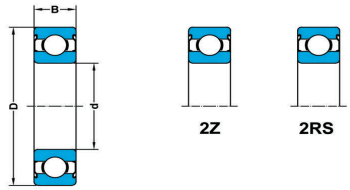
d40 - 55mm



Principal Dimensions			Basic Load ratings		Speed Ratings Lubrication	Mass	Designation
			Dynamic	Static	Grease		
d	D	B	C	C_0			
mm			kN		RPM	kg	
40	80	23	30.7	19	7000	0.44	62208-2RS
	90	23	42.3	24	6000	0.63	6308-2Z
	90	23	42.3	24	6000	0.63	6308-2RS
	90	33	41	24	6000	0.89	62308-2RS
45	58	7	6.63	6.1	8000	0.04	61809-2RS
	68	12	14	10.8	8000	0.14	61909-2RS
	75	16	22.1	14.6	8000	0.25	6009-2Z
	75	16	22.1	14.6	8000	0.25	6009-2RS
	75	23	20.8	14.6	8000	0.34	63009-2RS
	85	19	35.1	21.6	6000	0.41	6209-2Z
	85	19	35.1	21.6	6000	0.41	6209-2RS
	85	23	33.2	21.6	6000	0.48	62209-2RS
	100	25	55.3	31.5	5000	0.83	6309-2Z
	100	25	55.3	31.5	5000	0.83	6309-2RS
	100	36	52.7	31.5	5000	1.15	62309-2RS
50	65	7	6.76	6.8	8000	0.052	61810-2RS
	72	12	14.60	11.8	8000	0.14	61910-2RS
	80	16	22.9	16	7000	0.26	6010-2Z
	80	16	22.9	16	7000	0.26	6010-2RS
	80	23	21.6	16	7000	0.37	63010-2RS
	90	20	37.1	23.2	5000	0.46	6210-2Z
	90	20	37.1	23.2	5000	0.46	6210-2RS
	90	23	35.1	23.2	5000	0.52	62210-2RS
	110	27	65	38	4500	1.05	6310-2Z
	110	27	65	38	4500	1.05	6310-2RS
	110	40	61.8	38	4500	1.55	62310-2RS
55	72	9	9.04	8.8	8000	0.083	61811-2RS
	80	13	16.5	14	6000	0.19	61911-2RS
	90	18	26.6	21.2	6000	0.39	6011-2Z
	90	18	29.6	21.2	6000	0.39	6011-2RS
	100	21	46.2	29	5000	0.61	6211-2Z
	100	21	46.2	29	5000	0.61	6211-2RS
	100	25	43.6	29	5000	0.70	62211-2RS
	120	29	74.1	45	4000	1.35	6311-2Z
	120	29	74.1	45	4000	1.35	6311-2RS

Sealed Single Row Deep groove ball bearings

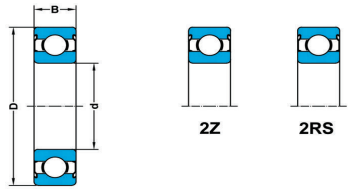
d55 - 75mm



Principal Dimensions			Basic Load ratings		Speed Ratings Lubrication	Mass	Designation
			Dynamic	Static	Grease		
d	D	B	C	C_0			
mm			kN		RPM	kg	
55	120	43	71.5	45	4000	1.95	62311-2RS
60	78	10	11.9	11.4	6000	0.11	61812-2RS
	85	13	16.5	14.3	6000	0.20	61912-2RS
	95	18	30.7	23.2	5000	0.42	6012-2Z
	95	18	30.7	23.2	5000	0.42	6012-2RS
	110	22	55.3	36	5000	0.78	6212-2Z
	110	22	55.3	36	4500	0.78	6212-2RS
	110	28	52.7	36	4500	0.97	62212-2RS
	130	31	85.2	52	4000	1.70	6312-2Z
	130	31	85.2	52	4000	1.70	6312-2RS
	130	46	81.9	52	4000	2.50	62312-2RS
65	85	10	12.4	12.7	6000	0.13	61813-2RS
	90	13	17.4	16	6000	0.22	61913-2RS
	100	18	31.9	25	5000	0.44	6013-2Z
	100	18	31.9	25	5000	0.44	6013-2RS
	120	23	58.5	40.5	4000	0.99	6213-2Z
	120	23	58.5	40.5	4000	0.99	6213-2RS
	120	31	55.9	40.5	4000	1.25	62213-2RS
	140	33	97.5	60	3500	2.10	6313-2Z
	140	33	97.5	60	3500	2.10	6313-2RS
	140	48	92.3	60	3500	3.00	62313-2RS
70	90	10	12.4	132	6000	0.14	61814-2RS
	100	16	23.8	21.2	5000	0.35	61914-2RS
	110	20	39.7	31	4000	0.60	6014-2Z
	110	20	39.7	31	4000	0.60	6014-2RS
	125	24	63.7	45	3500	1.10	6214-2Z
	125	24	63.7	45	3500	1.10	6214-2RS
	125	31	60.5	45	3500	1.30	62214-2RS
	150	35	111	68	3000	2.50	6314-2Z
	150	35	111	68	3000	2.50	6314-2RS
	150	51	104	68	3000	3.55	62314-2RS
75	95	10	12.7	14.3	5000	0.15	61815-2RS
	105	16	24.2	19.3	4000	0.37	61915-2RS
	115	20	41.6	33.5	3500	0.64	6015-2Z
	115	20	41.6	33.5	3500	0.64	6015-2RS

Sealed Single Row Deep groove ball bearings

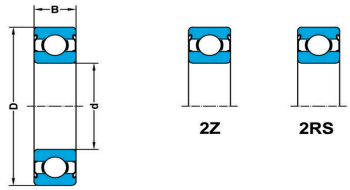
d75 - 100mm



Principal Dimensions			Basic Load ratings		Speed Ratings Lubrication	Mass	Designation
			Dynamic	Static	Grease		
d	D	B	C	C_0			
mm			kN		RPM	kg	
75	130	25	68.9	49	3000	1.20	6215-2Z
	130	25	68.9	49	3000	1.20	6215-2RS
	160	37	119.0	76.9	2700	3.00	6315-2Z
	160	37	119.0	76.5	2700	3.00	6315-2RS
80	100	10	13	15	4000	0.15	61816-2RS
	110	16	25.1	20.4	3500	0.40	61916-2RS
	125	22	49.4	40	3000	0.85	6016-2Z
	125	22	49.4	40	3000	0.85	6016-2RS
80	140	26	72.8	55	2800	1.40	6216-2Z
	140	26	42.8	55	2800	1.40	6216-2RS
	170	39	130.0	86.5	2500	3.60	6316-2Z
	170	39	130.0	86.5	2500	3.60	6316-2RS
85	110	13	19.5	20.8	4000	0.27	61817-2RS
	130	22	52.0	43	3000	0.89	6017-2Z
	130	22	52.0	43	3000	0.89	6017-2RS
	150	28	87.1	64	2700	1.80	6217-2Z
	180	41	140.0	96.5	2400	4.25	6317-2Z
	180	41	140.0	96.5	2400	4.25	6317-2RS
90	115	13	19.5	22	3500	0.28	61818-2RS
	140	24	60.5	50	3000	1.15	6018-2Z
	140	24	60.5	50	3000	1.15	6018-2RS
	160	30	101	73.5	2500	2.15	6218-2Z
	160	30	101	73.5	2500	2.15	6218-2RS
	190	43	151	108	2200	4.90	6318-2Z
	190	43	151	108	2200	4.90	6318-2RS
95	120	13	19.9	22.8	3000	0.30	61819-2RS
	130	18	33.8	33.5	3000	0.61	61919-2RS
	145	24	63.7	54	2800	1.20	6019-2Z
	145	24	63.7	54	2800	1.20	6019-2RS
	170	32	114	81.5	2400	2.60	6219-2Z
	170	32	114	81.5	2400	2.60	6219-2RS
	200	45	159	118	2100	5.65	6319-2Z
	200	45	159	118	2100	5.65	6319-2RS
100	125	13	19.9	24	3000	0.31	61820-2RS
	150	24	63.7	54	2800	1.25	6020-2Z

Sealed Single Row Deep groove ball bearings

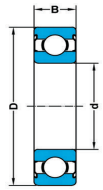
d100 - 160mm



Principal Dimensions			Basic Load ratings		Speed Ratings Lubrication	Mass	Designation
			Dynamic	Static	Grease		
d	D	B	C	C_0			
mm			kN		RPM	kg	
100	150	24	63.7	54	2800	1.25	6020-2RS
	180	34	127	93	2200	3.15	6220-2Z
	180	34	127	93	2200	3.15	6220-2RS
	215	47	174	140	2000	7.00	6320-2Z
105	130	13	20.8	19.6	2800	0.32	61821-2RS
	160	26	76.1	65.5	2500	1.60	6021-2Z
	160	26	76.1	65.5	2500	1.60	6021-2RS
	190	36	140	104	2100	3.70	6221-2Z
	190	36	140	104	2100	3.70	6221-2RS
	225	49	182	153	1800	8.25	6321-2Z
110	140	16	28.1	26	2800	0.60	61822-2RS
	170	28	85.2	73.5	2500	1.95	6022-2Z
	170	28	85.2	73.5	2500	1.95	6022-2RS
	200	38	151	118	2000	4.35	6222-2Z
120	150	16	29.1	28	2500	0.65	61824-2RS
	150	16	29.1	28	2500	0.65	61824-2RS
	180	28	88.4	80	2200	2.05	6024-2Z
	180	28	88.4	80	2200	2.05	6024-2RS
	215	40	146	118	1800	5.15	6224-2Z
130	165	18	37.7	43	2300	0.93	61826-2RS
	200	33	112	100	2000	3.15	6026-2Z
	200	33	112	100	2000	3.15	6026-2RS
	230	40	156	132	1600	5.80	6226-2Z
140	175	18	37.7	43	2200	0.99	61828-2RS
	210	33	111	108	2000	3.35	6028-2Z
	210	33	111	108	2000	3.35	6028-2RS
150	225	35	125	125	1800	4.80	6030-2Z
	225	35	125	125	1800	4.80	6030-2RS
160	240	38	143	143	1600	5.90	6032-2Z
	240	38	143	143	1600	5.90	6032-2RS

Deep groove ball bearings with filling slots and snap ring

d25-100mm



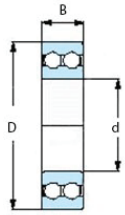
2Z

2RS

Principal Dimensions			Basic Load Ratings		Fatigue Load Limit	Speed Ratings		Mass	Designation Bearing Open	Shield Type	Snap Ring	Shield & Snap Ring
			Dynamic	Static		Ref Speed	Limiting Speed					
d	D	B	C	C_0	P_u							
mm			kN		kN	RPM		Kg				
25	52	15	20.0	14.0	0.60	22000	14000	0.18	205	ZZ	NR	ZZNR
	62	17	22.9	15.6	0.67	20000	13000	0.24	305	ZZ	NR	ZZNR
30	62	16	22.9	17.3	0.735	20000	12000	0.21	206	ZZ	NR	ZZNR
	72	19	29.2	20.8	0.88	18000	11000	0.37	306	ZZ	NR	ZZNR
35	72	17	29.7	22.8	0.965	17000	11000	0.31	207	ZZ	NR	ZZNR
	80	21	39.1	28.5	1.20	16000	10000	0.48	307	ZZ	NR	ZZNR
40	80	18	33.6	26.5	1.12	15000	9500	0.39	208	ZZ	NR	ZZNR
	90	23	46.8	36	1.53	14000	9000	0.64	308	ZZ	NR	ZZNR
45	85	19	39.6	32.5	1.37	14000	9000	0.44	209	ZZ	NR	ZZNR
	100	25	59.4	46.5	1.96	13000	8000	0.88	309	ZZ	NR	ZZNR
50	90	20	39.1	34.5	1.46	13000	8000	0.5	210	ZZ	NR	ZZNR
	110	27	64.4	52	2.02	11000	7000	1.15	310	ZZ	NR	ZZNR
55	100	21	48.4	44	1.86	12000	7500	0.66	211	ZZ	NR	ZZNR
	120	29	79.2	67	2.85	10000	6700	1.5	311	ZZ	NR	ZZNR
60	110	22	56.1	50	2.12	11000	6700	0.85	212	ZZ	NR	ZZNR
	130	31	91.3	78	3.35	9500	6000	1.85	312	ZZ	NR	ZZNR
65	120	23	60.5	58.5	2.5	10000	6000	1.05	213	ZZ	NR	ZZNR
	140	33	102	90	3.75	9000	5600	2.3	313	ZZ	NR	ZZNR
70	125	24	66	65.5	2.75	9500	6000	1.15	214	ZZ	NR	ZZNR
	150	35	114	102	4.15	8000	5000	2.75	314	ZZ	NR	ZZNR
75	130	25	72.1	72	3	9000	5600	1.25	215	ZZ	NR	ZZNR
	160	37	125	116	4.55	7500	4800	3.25	315	ZZ	NR	ZZNR
80	140	26	88	85	3.45	8500	5300	1.55	216	ZZ	NR	ZZNR
	170	39	138	129	4.9	7000	4500	3.95	316	ZZ	NR	ZZNR
85	150	28	96.8	100	3.9	7500	4800	1.95	217	ZZ	NR	ZZNR
	180	41	147	146	5.3	6700	4300	4.60	317	ZZ	NR	ZZNR
90	160	30	112	114	4.3	7000	4500	2.35	218	ZZ	NR	ZZNR
	190	43	157	160	5.7	6300	4000	5.4	318	ZZ	NR	ZZNR
95	170	32	121	122	4.5	6700	4300	2.70	219	ZZ	NR	ZZNR
100	180	34	134	140	5	6300	4000	3.45	220	ZZ	NR	ZZNR

Double Row Deep groove ball bearings

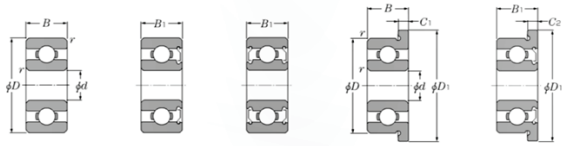
d10-100mm



Principal Dimensions			Basic Load Ratings		Fatigue Load Limit	Speed Rating		Mass	Designation
			Dynamic	Static		Limiting Speed	Ref Speed		
d	D	B	C	C_0	P_u	Grease	Oil		
mm			kN		kN	RPM	RPM	kg	
10	30	14	9.23	5.2	0.224	11000	20000	0.049	4200 ATN9
12	32	14	10.6	6.2	0.26	10000	18000	0.053	4201 ATN9
	37	17	13	7.8	0.325	9000	17000	0.092	4301 ATN9
15	35	14	11.9	7.5	0.32	8500	16000	0.059	4202 ATN9
	42	17	14.8	9.5	0.405	7500	14000	0.120	4302 ATN9
17	40	16	14.8	9.5	0.405	7500	14000	0.090	4203 ATN9
	47	19	19.5	13.2	0.56	6500	12000	0.16	4303 ATN9
20	47	18	17.8	12.5	0.53	6500	12000	0.14	4204 ATN9
	52	21	23.4	16	0.68	6000	11000	0.21	4304 ATN9
25	52	18	19	14.6	0.62	5500	10000	0.16	4205 ATN9
	62	24	31.9	22.4	0.95	5000	9000	0.34	4305 ATN9
30	62	20	26	20.8	0.88	4750	8500	0.26	4206 ATN9
	72	27	41	30	1.27	4250	8000	0.50	4306 ATN9
35	72	23	35.1	28.5	1.2	4000	7500	0.40	4207 ATN9
	80	31	50.7	38	1.63	3750	7000	0.69	4307 ATN9
40	80	23	37.1	32.5	1.37	3500	6500	0.50	4208 ATN9
	90	33	55.9	45	1.9	3350	6000	0.95	4308 ATN9
45	85	23	39	36	1.53	3350	6000	0.54	4209 ATN9
	100	36	68.9	56	2.4	3000	5500	1.25	4309 ATN9
50	90	23	41	40	1.7	3000	5500	0.58	4210 ATN9
	110	40	81.9	69.5	2.9	2650	5000	1.70	4310 ATN9
55	100	25	44.9	44	1.9	2800	5000	0.80	4211 ATN9
	120	43	97.5	83	3.45	2500	4500	2.15	4311 ATN9
60	110	28	57.2	55	2.36	2650	4750	1.10	4212 ATN9
	130	46	112	98	4.15	2750	4250	2.65	4312 ATN9
65	120	31	67.6	67	2.8	2400	4250	1.45	4213 ATN9
	140	48	121	106	4.5	2150	4000	3.25	4313 ATN9
70	125	31	70.2	73.5	3.1	2150	4000	1.50	4214 ATN9
	150	51	138	125	5	1900	3500	3.95	4314 ATN9
75	130	31	72.8	80	3.35	2000	3750	1.60	4215 ATN9
	160	55	156	143	5.5	1800	3350	4.80	4315 ATN9
80	140	33	80.6	90	3.6	1900	3500	2.00	4216 ATN9
85	150	36	93.6	102	4	1800	3500	2.55	4217 ATN9
90	160	40	112	122	.65	1700	3150	3.20	4218 ATN9
100	180	46	140	156	5.6	1500	2800	4.70	4220 ATN9

Miniature Ball Bearings

Inch series
d1.5 - 4mm



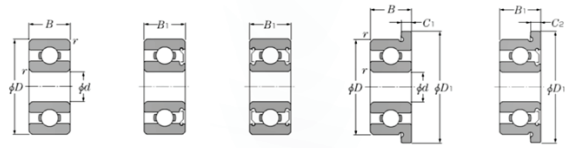
Open type | With single shield (Z) | With double shield (ZZ) | Open type with flange (FL) | With flanged outer ring and single shield (FL···Z)

Boundary Dimensions			Basic Load Ratings			Limiting Speeds				Bearing Numbers		Weight	Unsealed type with flange
			Dynamic	kN	Static	Grease	Oil	Open	with double shield	unsealed type with flange	with flanged or and double shield	g open	
d	D	B	B1	Cr	C or								
1.5	4	1.2	2	0.10	0.03	44000	50000	68/1.5	ZZ	FL68/1.5	ZZ	0.07	0.09
	5	2	2.6	0.17	0.05	39500	46500	69/1.5A	ZZ	FL69/1.5A	ZZ	0.18	0.24
	6	2.5	3	0.27	0.09	35500	42000	60/1.5	ZZ	FL60/1.5	ZZ	0.35	0.42
	4	1.2	2	0.10	0.04	41500	49000	672	-	-	-	0.06	-
	5	1.5	2.3	0.17	0.05	37000	43500	682	ZZ	FL682	ZZ	0.13	0.17
	5	2	2.5	0.17	0.05	37000	43500	BC2-5	ZZ	-	-	0.16	-
2	6	2.3	3	0.28	0.09	33500	39500	692	ZZ	FL692	ZZ	0.31	0.38
	6	2.5	-	0.28	0.09	33500	39500	BC2-6	-	FLBC2-6	-	0.32	0.38
	7	2.5	-	0.39	0.01	29500	35000	BC2-7A	-	-	-	0.44	-
	7	2.8	3.5	0.38	0.01	31000	36500	602	ZZ	FL602	ZZ	0.54	0.64
	5	1.5	2.3	0.15	0.06	35000	41000	67/2.5	ZZ	-	-	0.11	-
	6	1.8	2.6	0.21	0.07	32500	38000	68/2.5	ZZ	FL68/2.5	ZZ	0.22	0.26
	7	3	3	0.28	0.10	29500	35000	-	ZZ	-	ZZ	0.6	0.67
2.5	7	2.5	3.5	0.28	0.10	29500	35000	69/2.5	ZZ	FL69/2.5	ZZ	0.43	0.53
	8	2.5	2.8	0.43	0.15	28000	33000	BC2.5-8	ZZ	FLBC2.5-8	-	0.57	0.65
	8	2.8	4	0.55	0.17	28000	33000	60/2.5	ZZ	FL60/2.5	ZZ	0.72	0.83
	6	2	2.5	0.24	0.09	30000	35500	673	ZZ	FL673	ZZ	0.2	0.26
	7	2	3	0.39	0.13	29000	34000	683	ZZ	FL683	ZZ	0.33	0.38
	8	2.5	-	0.56	0.18	27000	31500	BC3-8	-	FLBC3-8	-	0.52	0.6
3	8	3	4	0.56	0.18	27000	31500	693	ZZ	FL693	ZZ	0.61	0.72
	9	2.5	4	0.64	0.22	25000	29500	BC3-9	ZZ	FLBC3-9	ZZ	0.71	0.79
	9	3	5	0.64	0.22	25000	29500	603	ZZ	FL603	ZZ	0.92	1
	10	4	4	0.64	0.22	25000	29000	623	ZZ	FL623	ZZ	1.6	1.8
	7	2	2.5	0.22	0.09	27000	31500	674A	ZZ	FL674A	ZZ	0.28	0.35
	8	2	3	0.40	0.14	26000	30500	BC4-8	ZZ	FLBC4-8	ZZ	0.38	0.46
	9	2.5	4	0.64	0.22	24500	28500	684AX50	ZZ	FL684AX50	ZZ	0.67	0.76
	10	3	4	0.65	0.24	23000	27500	BC4-10	ZZ	FLBC4-10	ZZ	1	1.1
4	11	4	4	0.71	0.28	22500	26000	694	ZZ	FL694	ZZ	1.8	2
	12	4	4	0.97	0.36	21500	25500	604	ZZ	FL604	ZZ	2.1	2.3
	13	5	5	1.3	0.49	21000	24500	624	ZZ	FL624	ZZ	3.2	3.5
	16	5	5	1.8	0.68	18500	22000	634	ZZ	-	-	5.1	-
	8	2	2.5	0.22	0.09	24500	28500	675	ZZ	FL675	ZZ	0.32	0.4

Miniature Ball Bearings

Inch series

d5 - 9mm



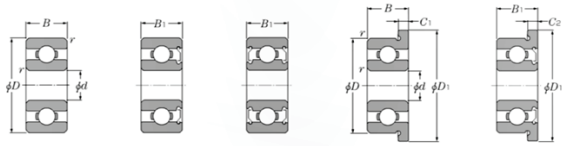
Open type | With single shield (Z) | With double shield (ZZ) | Open type with flange (FL) | With flanged outer ring and single shield (FL···Z)

Boundary Dimensions			Basic Load Ratings			Limiting Speeds				Bearing Numbers		Weight	Unsealed type with flange
			Dynamic	kN	Static	Grease	Oil	Open	with double shield	unsealed type with flange	with flanged or and double shield	g open	
d	D	B	B1	Cr	C or								
5	9	2.5	3	0.50	0.21	23000	27500	BC5-9	ZZ	FLBC5-9	ZZ	0.55	0.63
	10	3	4	0.72	0.28	22500	26000	BC5-10	ZZ	FLBC5-10	ZZ	0.88	0.97
	11	4	4	0.71	0.28	21500	25500	-	ZZ	-	ZZ	1.8	2
	11	3	5	0.71	0.28	21500	25500	685	ZZ	FL685	ZZ	1.1	1.3
	13	4	4	1.08	0.43	20000	23500	695	ZZ	FL695	ZZ	2.4	2.7
	13	5	5	1.08	0.43	20000	23500	-	ZZ	-	ZZ	3.4	3.7
	14	5	5	1.33	0.50	19500	23000	605	ZZ	FL605	ZZ	3.5	3.9
	16	5	5	1.76	0.68	18500	22000	625	ZZ	FL625	ZZ	4.8	5.2
	19	6	6	2.34	0.88	17000	20000	635	ZZ	-	-	8	-
	10	2.5	3	0.46	0.20	21500	25500	676A	ZZ	FL676A	ZZ	0.65	0.74
	12	3	4	0.83	0.36	20000	23500	BC6-12	ZZ	FLBC6-12	ZZ	1.3	1.4
	13	3.5	5	1.08	0.44	19500	23000	686	ZZ	FL686	ZZ	1.9	2.2
6	15	5	5	1.35	0.53	18500	22000	696	ZZ	FL696	ZZ	3.8	4.3
	16	6	6	1.77	0.69	18000	21000	BC6-16A	ZZ	-	-	5.2	-
	17	6	6	2.19	0.86	17500	21000	606	ZZ	FL606	ZZ	6	6.5
	19	6	6	2.34	0.88	17000	20000	626	ZZ	FL626	ZZ	8.1	9.2
	11	2.5	3	0.55	0.27	20000	23500	677	ZZ	FL677	ZZ	0.67	0.77
	13	3	4	0.82	0.38	19000	22500	BC7-13	ZZ	FLBC7-13	ZZ	1.4	1.5
	14	3.5	5	1.17	0.50	18500	22000	687A	ZZ	FL687A	ZZ	2.1	2.4
7	17	5	5	1.61	0.71	17500	20500	697	ZZ	FL697	-	5.2	5.7
	19	6	6	2.24	0.91	17000	20000	607	ZZ	-	-	8	-
	22	7	7	3.35	1.40	16000	18500	627	ZZ	-	-	13	-
	12	2.5	3.5	0.51	0.25	19000	22500	678A	ZZ	FL678A	ZZ	0.75	0.86
	14	3.5	4	0.82	0.38	18000	21500	BC8-14	ZZ	FLBCB-14	ZZ	1.8	1.9
8	16	4	5	1.61	0.71	17500	20500	688A	ZZ	FL688A	ZZ	3.1	3.5
	19	6	6	1.99	0.86	16500	19500	698	ZZ	FL698	ZZ	7.3	8.4
	22	7	7	3.35	1.40	16000	18500	608	ZZ	FL608	ZZ	12	13
	24	8	8	4.00	1.59	15500	18000	628	ZZ	-	-	17	-
	14	3	4.5	0.92	0.46	18000	21000	679	ZZ	-	-	1.4	-
	17	4	5	1.72	0.82	16500	19500	689	ZZ	FL689	ZZ	3.2	3.6
9	20	6	6	2.48	1.09	16000	19000	699	ZZ	-	-	8.2	-
	24	7	7	3.40	1.45	15500	18000	609	ZZ	-	-	14	-
	26	8	8	4.55	1.96	15500	17500	629X50	ZZ	-	-	20	-

Miniature Ball Bearings

Inch series

1.984 - 9.525mm

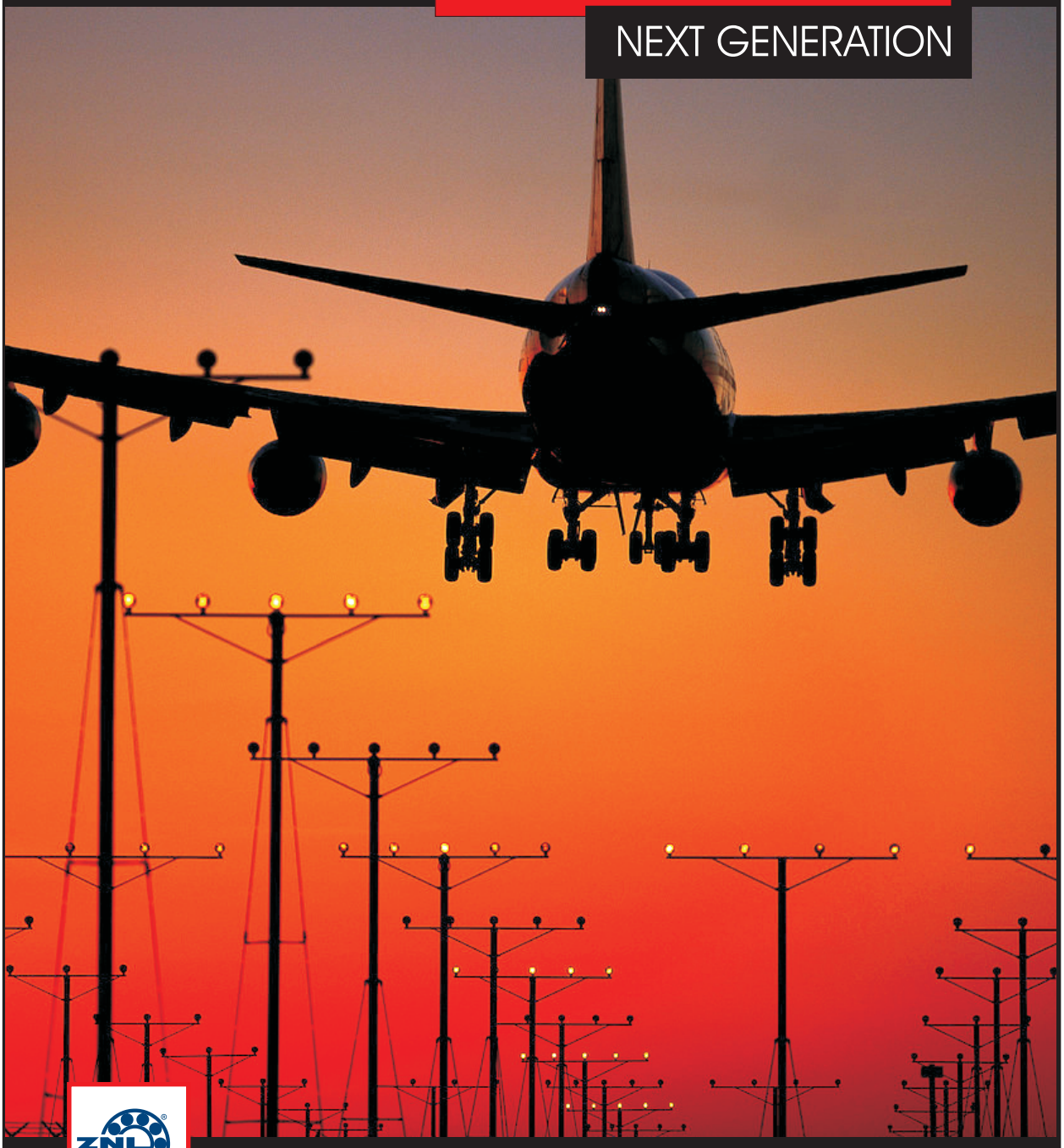


Open type | With single shield (Z) | With double shield (ZZ) | Open type with flange (FL) | With flanged outer ring and single shield (FL…Z)

Boundary Dimensions			Basic Load Ratings			Limiting Speeds				Bearing Numbers		Weight	Unsealed type with flange
			Dynamic	kN	Static	Grease	Oil	Open	with dou-ble shield	unsealed type with flange	with flanged or and double shield	g open	
d	D	B	B1	Cr	C or								
1.984	6.35	2.38	3.571	0.28	0.09	33500	39500	R1-4	ZZ	FLR1-4	ZZ	0.35	0.41
2.38	4.762	1.588	2.38	0.12	0.04	36500	42500	R133	ZZ	FLR133	ZZ	0.12	0.16
	7.938	2.779	3.571	0.43	0.15	28000	33000	R1-5	ZZ	FLR1-5	ZZ	0.69	0.76
	6.35	2.38	2.779	0.28	0.10	29500	35000	R144	ZZ	FLR144	ZZ	0.27	0.33
	7.938	2.779	3.571	0.56	0.18	27000	31500	R2-5	ZZ	FLR2-5	ZZ	0.61	0.68
3.175	9.525	2.779	3.571	0.64	0.22	24500	29000	R2-6	ZZ	FLR2-6	ZZ	0.88	0.96
	9.525	3.967	3.967	0.64	0.22	24500	29000	R2	ZZ	FLR2	ZZ	1.3	1.5
	12.7	4.366	4.366	1.15	0.39	21500	25500	RA2	ZZ	-	-	2.5	-
3.967	7.938	2.779	3.175	0.33	0.13	25500	30000	R156	ZZ	FLR155	ZZ	0.54	0.61
	7.938	2.779	3.175	0.40	0.14	24500	29000	R156	ZZ	FLR156	ZZ	0.44	0.51
4.762	9.525	3.175	3.175	0.71	0.27	23000	27500	R166	ZZ	FLR166	ZZ	0.8	0.89
	12.7	3.967	-	1.31	0.49	20500	24000	R3	-	-	-	2.2	-
	12.7	4.978	4.978	1.31	0.49	20500	24000	RA3	ZZ	FLRA3	ZZ	2.4	2.7
	9.525	3.175	3.175	0.21	0.09	21500	25500	R168A	ZZ	-	ZZ	0.6	0.69
6.35	12.7	3.175	4.762	0.83	0.37	19500	23000	R188	ZZ	FLR188	ZZ	1.6	1.7
	15.875	4.978	4.978	1.48	0.61	18000	21500	R4	ZZ	FLR4	ZZ	4.4	4.8
	19.05	-	7.142	2.34	0.88	17000	20000	-	ZZ	-	-	11	-
9.525	22.225	-	7.142	3.30	1.40	15500	18500	-	ZZ	-	ZZ	14	15

AVIATION INDUSTRIES

NEXT GENERATION



ACBB

Angular Contact
Ball Bearings

Angular Contact Ball Bearing

Angular Contact Ball Bearing

In angular contact ball bearing inner and outer rings are displaced with respect to each other in direction of bearings axis. They are designed for commendation of combined load, acting radial and axial. An axial load carrying capacity of angular contact ball bearing increase as increase contact angle.

Type

Single row angular contact ball bearing
Double row angular contact ball bearing
Four point contact ball bearing

Series available

Single row
7000, 7200, 7300, 7400
Double row
3200, 3300, 5200, 5300
Four point contact
QJ 200 & QJ 300

Single Row Angular Contact Ball Bearing

(Available in Steel, Brass & Polymide Cages)
Can accommodate axial load carrying in unidirectional only. Have only limited ability to accommodate misalignment.
More Series Available ALS, AMS

Double Row Angular Contact Ball Bearing

It is designed to correspond, two single row angular contact ball bearing, which takes less axial space. Can accommodate high radial and axial load acting in bidirectional.

Single Row Angular Contact Ball Bearing:-

These bearing have a contact angle so they can sustain significant axial loads in one direction together with radial loads. Because of their design, when radial load is applied component produce an axial force. Because of these two opposed bearings or a combination of more than two must be used. As the rigidity of single row angular contact ball bearing can be increased by preloading. They are often used in the main spindles machine tools with which running accuracy is require.

Double Row Angular Contact Ball Bearing:-

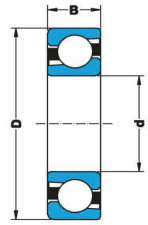
This is basically a back to back mounting of two single angular contact ball bearings, but their inner and outer rings are each integrated into one. This type of bearings can be sustained axial load in both directions this type is used as fixed end bearings.

Precaution for use of angular contact ball bearings:-

Operating conditions; where vibration and moment load are heavy, lubrication is marginal, the speed and temperature are closed to their limit, this bearing may not be suitable and if the load on angular contact ball bearings become too small or the ratio of the axial and radial loads for matched bearings exceed during operation, slippage occurs between the ball and raceways, which may result in smearing, especially in large bearing where the weight of ball and cage is high.

Angular Contact Ball Bearing

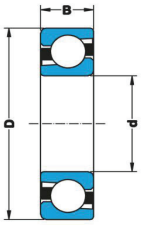
Single row
d10 - 85mm



Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0	RPM			
mm			kN				Kg	
10	30	9	7.02	3.35	19000	28000	0.030	7200 B
12	32	10	7.61	3.80	18000	26000	0.036	7201 B
	37	12	10.6	5.00	17000	24000	0.060	7301 B
15	35	11	8.84	4.80	17000	24000	0.045	7202 B
	42	13	13.00	6.70	15000	20000	0.080	7302 B
17	40	12	10.4	5.5	15000	20000	0.065	7203 B
	47	14	15.90	8.30	13000	18000	0.11	7303 B
20	47	14	14.00	8.30	12000	17000	0.11	7204 B
	52	15	19.00	10.40	11000	16000	0.14	7304 B
25	52	15	15.60	10.20	10000	15000	0.13	7205 B
	62	17	26.00	15.60	9000	13000	0.23	7305 B
30	62	16	23.80	15.60	8500	12000	0.20	7206 B
	72	19	34.50	21.20	8000	11000	0.34	7306 B
35	72	17	30.70	20.80	8000	11000	0.28	7207 B
	80	21	39.00	24.50	7500	10000	0.45	7307 B
40	80	18	34.60	26.00	7000	9500	0.37	7208 B
	90	23	49.40	33.50	6700	9000	0.63	7308 B
45	85	19	37.70	28.00	6700	9000	0.42	7209 B
	100	25	60.50	41.50	6000	8000	0.85	7309 B
50	90	20	39.00	30.50	6000	8000	0.47	7210 B
	110	27	74.10	51.00	5300	7000	1.10	7310 B
55	100	21	48.80	38.00	5600	7500	0.62	7211 B
	120	29	85.20	60.00	4800	6300	1.40	7311 B
60	110	22	57.20	45.50	5000	6700	0.80	7212 B
	130	31	95.600	69.50	4500	6000	1.75	7312 B
65	120	23	66.3	54.00	4500	6000	1.00	7213 B
	140	33	108.00	80.00	4300	5600	2.15	7313 B
70	125	24	71.50	60.00	4300	5600	1.10	7214 B
	150	35	119.0	90.00	3800	5000	2.65	7314 B
75	130	25	72.80	64.00	4300	5600	1.20	7215 B
	160	37	133.00	106.00	3600	4800	3.20	7315 B
80	140	26	83.20	73.50	3800	5000	1.45	7216 B
	170	39	143.00	118.00	3400	4500	3.80	7316 B
85	150	28	95.60	83.00	3600	4800	1.85	7217 B
	180	41	153.00	132.00	3200	4300	4.45	7317 B

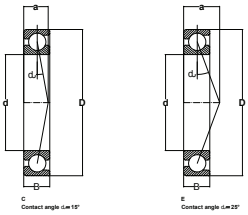
Angular Contact Ball Bearing

Single row
d90 - 240mm



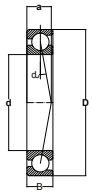
Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static	Grease	Oil		
d	D	B	C	C_0	RPM			
mm			kN				Kg	
90	160	30	108.00	96.00	3400	4500	2.30	7218 B
	190	43	165.00	146.00	3000	4000	5.20	7318 B
95	170	32	124.00	148.00	3200	4300	2.70	7219 B
	200	45	178.00	163.00	2800	3800	6.05	7319 B
100	180	34	135.00	122.00	3000	4000	3.30	7220 B
	215	47	203.00	19.00	2600	3600	7.50	7320 B
105	190	36	148.00	137.00	2800	3800	3.95	7221 B
	225	49	212.00	208.00	2400	3400	8.55	7321 B
110	200	38	163.00	153.00	2600	3600	4.60	7222 B
	240	50	225.00	224.00	2200	3200	10.00	7322 B
120	215	40	165.00	163.00	2200	3200	6.10	7224 B
	260	55	238.00	250.00	1900	2800	14.50	7324 B
130	230	40	186.00	193.00	1900	2800	6.95	7226 B
	280	58	251.00	270.00	1800	2600	17.50	7326 B
140	250	42	182.00	196.00	1800	2600	8.85	7228 B
	300	62	276.00	310.00	1700	2400	21.50	7328 B
150	270	45	195	224	1700	2400	11.5	7230 B
	320	65	302	265	1600	2200	26.0	7330 B
160	290	48	199	236	1600	2200	14.0	7232 B
170	310	52	221	270	1600	2200	17.5	7234 B
	360	72	358	455	1400	1900	36.0	7334 B
180	320	52	251	320	1500	2000	18.0	7236 B
	380	75	371	490	1300	1800	42.0	7336 B
190	340	55	276	355	1400	1900	22.0	7238 B
	400	78	410	560	1200	1700	48.5	7338 B
220	400	65	319	465	1100	1600	37.0	7244 B
240	440	72	364	540	1000	1500	49.0	7248 B

ZNL Spindle Bearings

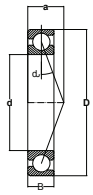


Shaft	Dimension				Load Rating		Limiting Speed[1])		Weight ≈	Number
	d mm	D	B	a ≈	Dynamic C kN	Static C_0	Grease min^{-1}	Oil mist	kg	Bearing
15	15	28	7	6	4.75	2.28	43000	56000	0.016	B71902C.TPA.P4
	15	32	9	8	6.2	2.9	40000	53000	0.03	B7002C.TPA.P4
	15	32	9	8	6.2	2.9	40000	53000	0.03	B7002C.TPA.P4.UL
	15	35	11	9	7.65	3.55	38000	50000	0.046	B7202C.TPA.P4
	15	35	11	9	7.65	3.55	38000	50000	0.046	B7202C.TPA.P4.UL
17	17	30	7	7	5	2.55	40000	53000	0.017	B71903C.TPA.P4.UL
	17	35	10	9	7.2	3.6	36000	48000	0.039	B7003C.TPA.P4
	17	35	10	9	7.2	3.6	36000	48000	0.039	B7003C.TPA.P4.UL
	17	40	12	10	9.5	4.65	34000	45000	0.068	B7203C.TPA.P4
	17	40	12	10	9.5	4.65	34000	45000	0.068	B7203C.TPA.P4.UL
20	20	37	9	8	8.8	4.4	34000	45000	0.034	B71904C.TPA.P4.UL
	20	42	12	10	10	5.2	30000	40000	0.069	B7004C.TPA.P4
	20	42	12	10	10	5.2	30000	40000	0.069	B7004C.TPA.P4.UL
	20	47	14	12	12.9	6.55	28000	38000	0.108	B7204C.TPA.P4
	20	47	14	12	12.9	6.55	28000	38000	0.108	B7204C.TPA.P4.UL
25	25	42	9	9	9.15	5	28000	38000	0.04	B71905C.TPA.P4.UL
	25	42	9	12	8.65	4.8	24000	34000	0.04	B71905E.TPA.P4.UL
	25	47	12	11	11	6.3	26000	36000	0.084	B7005C.TPA.P4
	25	47	12	11	11	6.3	26000	36000	0.084	B7005C.TPA.P4.UL
	25	52	15	13	14.6	8	24000	34000	0.133	B7205C.TPA.P4
	25	52	15	13	14.6	8	24000	34000	0.133	B7205C.TPA.P4.UL
	25	52	15	17	13.7	7.65	22000	32000	0.133	B7205E.TPA.P4.UL
30	30	47	9	10	10	6	24000	34000	0.046	B71906C.TPA.P4.UL
	30	47	9	14	9.5	5.7	22000	32000	0.046	B71906E.TPA.P4.UL
	30	55	13	12	14.3	8.65	22000	32000	0.117	B7006C.TPA.P4
	30	55	13	12	14.3	8.65	22000	32000	0.117	B7006C.TPA.P4.UL
	30	62	16	14	20.8	12	20000	30000	0.204	B7206C.TPA.P4
	30	62	16	14	20.8	12	20000	30000	0.204	B7206C.TPA.P4.UL
	30	62	16	19	20	11.4	18000	26000	0.204	B7206E.TPA.P4.UL
35	35	55	10	11	11	7.5	22000	32000	0.076	B71907C.TPA.P4.UL
	35	55	10	16	10.4	7.1	18000	26000	0.076	B71907E.TPA.P4.UL
	35	62	14	14	16.3	10.6	19000	28000	0.157	B7007C.TPA.P4
	35	62	14	14	16.3	10.6	19000	28000	0.157	B7007C.TPA.P4.UL
	35	62	14	18	15.6	10	17000	24000	0.157	B7007E.TPA.P4.UL
	35	72	17	16	25.5	15.6	18000	26000	0.296	B7207C.TPA.P4
	35	72	17	16	25.5	15.6	18000	26000	0.296	B7207C.TPA.P4.UL
	35	72	17	21	24.5	15	16000	22000	0.296	B7207E.TPA.P4.UL

ZNL Spindle Bearings



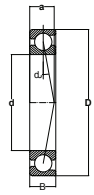
C
Contact angle α=15°



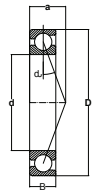
E
Contact angle α=25°

Shaft	Dimension				Load Rating		Limiting speed[1])		Weight ≈	Number
	c mm	D	B	a ≈	Dynamic C kN	Static C_0	Grease min^{-1}	Oil mist	kg	Bearing
40	40	62	12	13	16.3	10.6	19000	28000	0.105	B71908C.TPA.P4.UL
	40	62	12	18	15.3	10.2	16000	22000	0.105	B71908E.TPA.P4.UL
	40	68	15	15	17.3	12.2	18000	26000	0.196	B7008C.TPA.P4
	40	68	15	15	17.3	12.2	18000	26000	0.196	B7008C.TPA.P4.UL
	40	68	15	20	16.6	11.6	15000	20000	0.196	B7008E.TPA.P4.UL
	40	80	18	17	34.5	20	16000	22000	0.364	B7208C.TPA.P4
	40	80	18	17	34.5	20	16000	22000	0.364	B7208C.TPA.P4.UL
	40	80	18	23	32.5	19.3	14000	19000	0.364	B7208E.TPA.P4
45	45	68	12	14	17.3	12.2	17000	24000	0.126	B71909C.TPA.P4.UL
	45	68	12	19	16.3	11.6	15000	20000	0.126	B71909E.TPA.P4.UL
	45	75	16	16	23.2	16	16000	22000	0.236	B7009C.TPA.P4
	45	75	16	16	23.2	16	16000	22000	0.236	B7009C.TPA.P4.UL
	45	75	16	22	22	15.3	14000	19000	0.236	B7009E.TPA.P4.UL
	45	85	19	18	40.5	25	15000	20000	0.408	B7209C.TPA.P4
	45	85	19	25	39	24	13000	18000	0.408	B7209E.TPA.P4.UL
50	50	72	12	14	19	14.6	15000	20000	0.129	B71910C.TPA.P4.UL
	50	72	12	20	18	13.7	14000	19000	0.129	B71910E.TPA.P4.UL
	50	80	16	17	24.5	18.3	15000	20000	0.262	B7010C.TPA.P4
	50	80	16	17	24.5	18.3	15000	20000	0.262	B7010C.TPA.P4.UL
	50	80	16	23	23.2	17.3	13000	18000	0.262	B7010E.TPA.P4
	50	90	20	19	45	28.5	14000	19000	0.459	B7210C.TPA.P4
	50	90	20	19	45	28.5	14000	19000	0.459	B7210C.TPA.P4.UL
	50	90	20	26	42.5	27.5	12000	17000	0.459	B7210E.TPA.P4.UL
55	55	80	13	16	22	17	14000	19000	0.176	B71911C.TPA.P4.UL
	55	80	13	22	20.8	16.3	12000	17000	0.176	B71911E.TPA.P4.UL
	55	90	18	19	34	25	13000	18000	0.383	B7011C.TPA.P4
	55	90	18	19	34	25	13000	18000	0.383	B7011C.TPA.P4.UL
	55	90	18	26	32.5	23.6	11000	16000	0.383	B7011E.TPA.HG.UL
	55	100	21	21	53	34.5	12000	17000	0.608	B7211C.TPA.P4
	55	100	21	21	53	34.5	12000	17000	0.608	B7211C.TPA.P4.UL
	55	100	21	29	50	33.5	11000	16000	0.608	B7211E.TPA.P4.UL
60	60	85	13	16	23.2	19	13000	18000	0.19	B71912C.TPA.P4.UL
	60	85	13	23	22	18	11000	16000	0.19	B71912E.TPA.P4.UL
	60	95	18	19	35.5	26.5	12000	17000	0.41	B7012C.TPA.P4
	60	95	18	19	35.5	26.5	12000	17000	0.41	B7012C.TPA.P4.UL
	60	95	18	27	33.5	25.5	11000	16000	0.41	B7012E.TPA.P4.UL

ZNL Spindle Bearings



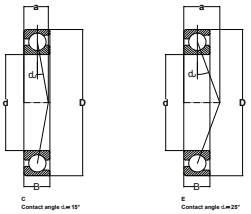
C
Contact angle α=15°



E
Contact angle α=25°

Shaft	Dimension				Load Rating		Limiting speed[1])		Weight ≈	Number
	d mm	D	B	a ≈	Dynamic C kN	Static C_0	Grease min^{-1}	Oil mist	kg	Bearing
60	60	110	22	23	64	42.5	11000	16000	0.782	B7212C.TPA.P4
	60	110	22	23	64	42.5	11000	16000	0.782	B7212C.TPA.P4.UL
	60	110	22	31	61	40.5	9500	14000	0.782	B7212E.TPA.P4.UL
65	65	90	13	17	23.6	20	12000	17000	0.202	B71913C.TPA.P4.UL
	65	90	13	25	22.4	19	11000	16000	0.202	B71913E.TPA.P4.UL
	65	100	18	20	36	28.5	11000	16000	0.435	B7013C.TPA.P4
	65	100	18	20	36	28.5	11000	16000	0.435	B7013C.TPA.P4.UL
	65	100	18	28	34	27	10000	15000	0.435	B7013E.TPA.P4.UL
	65	120	23	24	72	49	10000	15000	0.997	B7213C.TPA.P4
	65	120	23	24	72	49	10000	15000	0.997	B7213C.TPA.P4.UL
	65	120	23	33	69.5	46.5	9000	13000	0.997	B7213E.TPA.P4.UL
70	70	100	16	19	32.5	27.5	11000	16000	0.331	B71914C.TPA.P4.UL
	70	100	16	28	30.5	26	10000	15000	0.331	B71914E.TPA.P4.UL
	70	110	20	22	45.5	36	11000	16000	0.606	B7014C.TPA.P4
	70	110	20	22	45.5	36	11000	16000	0.606	B7014C.TPA.P4.UL
	70	110	20	31	44	34.5	9000	13000	0.606	B7014E.TPA.P4.UL
	70	125	24	25	76.5	52	9500	14000	1.08	B7214C.TPA.P4
	70	125	24	25	76.5	52	9500	14000	1.08	B7214C.TPA.P4.UL
	70	125	24	35	72	50	8500	12000	1.08	B7214E.TPA.P4.UL
75	75	105	16	20	33.5	28.5	11000	16000	0.351	B71915C.TPA.P4.UL
	75	105	16	29	31	27	9000	13000	0.351	B71915E.TPA.P4.UL
	75	115	20	23	47.5	39	10000	15000	0.642	B7015C.TPA.P4
	75	115	20	23	47.5	39	10000	15000	0.642	B7015C.TPA.P4.UL
	75	115	20	32	45	36.5	8500	12000	0.642	B7015E.TPA.P4.UL
	75	130	25	26	80	57	9000	13000	1.18	B7215C.TPA.P4
	75	130	25	36	75	54	8000	11000	1.18	B7215E.TPA.P4.UL
80	80	110	16	21	33.5	30	10000	15000	0.37	B71916C.TPA.P4.UL
	80	110	16	30	32	28.5	8500	12000	0.37	B71916E.TPA.P4.UL
	80	125	22	25	58.5	48	9000	13000	0.857	B7016C.TPA.P4
	80	125	22	25	58.5	48	9000	13000	0.857	B7016C.TPA.P4.UL
	80	125	22	35	56	45.5	8000	11000	0.857	B7016E.TPA.P4.UL
	80	140	26	28	93	67	8500	12000	1.45	B7216C.TPA.P4
	80	140	26	28	93	67	8500	12000	1.45	B7216C.TPA.P4.UL
	80	140	26	29	88	64	7500	10000	1.45	B7216E.TPA.P4.UL
85	85	120	18	23	44	39	9000	13000	0.536	B71917C.TPA.P4.UL
	85	120	18	33	41.5	36.5	8000	11000	0.536	B71917E.TPA.P4.UL

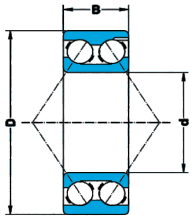
ZNL Spindle Bearings



Shaft	Dimension				Load Rating		Limiting speed[1])		Weight ≈	Number
	d mm	D	B	a ≈	Dynamic C kN	Static C_0	Grease min^{-1}	Oil mist	kg	Bearing
85	85	130	22	25	60	51	8500	12000	0.903	B7017C.TPA.P4
	85	130	22	25	60	51	8500	12000	0.903	B7017C.TPA.P4.UL
	85	130	22	36	57	49	7500	10000	0.903	B7017E.TPA.P4.UL
	85	150	28	30	104	78	8000	11000	1.85	B7217C.TPA.P4
	85	150	28	30	104	78	8000	11000	1.85	B7217C.TPA.P4.UL
	85	150	28	41	98	75	6700	9000	1.85	B7217E.TPA.P4.UL
90	90	125	18	23	45	40.5	8500	12000	0.565	B71918C.TPA.P4.UL
	90	125	18	34	42.5	39	7500	10000	0.565	B71918E.TPA.P4.UL
	90	140	24	27	72	60	8000	11000	1.18	B7018C.TPA.P4
	90	140	24	27	72	60	8000	11000	1.18	B7018C.TPA.P4.UL
	90	140	24	39	68	57	7000	9500	1.18	B7018E.TPA.P4.UL
	90	160	30	32	120	91.5	7000	9500	2.25	B7218C.TPA.P4
	90	160	30	32	120	91.5	7000	9500	2.25	B7218C.TPA.P4.UL
	90	160	30	44	114	88	6300	8500	2.25	B7218E.TPA.P4.UL
95	95	130	18	24	45.9	43	8000	11000	0.578	B71919C.TPA.P4.UL
	95	130	18	35	43	40.5	7000	9500	0.578	B71919E.TPA.P4.UL
100	100	140	20	26	47.5	46.5	7500	10000	0.882	B71920C.TPA.P4.UL
	100	140	20	38	44	44	6700	9000	0.882	B71920E.TPA.P4.UL
	100	150	24	29	75	68	7000	9500	1.28	B7020C.TPA.P4
	100	150	24	29	75	68	7000	9500	1.28	B7020C.TPA.P4.UL
	100	150	24	41	71	64	6300	8500	1.28	B7020E.TPA.P4.UL
	100	180	34	36	156	118	6300	8500	3.24	B7220C.TPA.P4
	100	180	34	36	156	118	6300	8500	3.24	B7220C.TPA.P4.UL
	100	180	34	50	150	112	5600	7500	3.24	B7220E.TPA.P4.UL
110	110	150	20	27	60	58.5	7000	9500	0.845	B71922C.TPA.P4.UL
	110	150	20	40	57	55	6000	8000	0.845	B71922E.TPA.P4.UL
	110	170	28	33	102	90	6300	8500	1.98	B7022C.TPA.P4
	110	170	28	33	102	90	6300	8500	1.98	B7022C.TPA.P4.UL
	110	170	28	47	96.5	86.5	5600	7500	1.98	B7022E.TPA.P4.UL
	110	200	38	55	166	132	5000	6700	4.47	B7222E.TPA.P4.UL
120	120	165	22	30	73.5	73.5	6300	8500	1.16	B71924C.TPA.P4.UL
	120	165	22	44	69.5	69.5	5300	7000	1.16	B71924E.TPA.P4.UL
	120	180	28	34	104	96.5	6000	8000	2.12	B7024C.TPA.P4
	120	180	28	34	104	96.5	6000	8000	2.12	B7024C.TPA.P4.UL
	120	180	28	49	98	91.5	5000	6700	2.12	B7024E.TPA.P4.UL
	120	215	40	59	173	146	4500	6000	5.52	B7224E.TPA.P4.UL

Angular Contact Ball Bearings

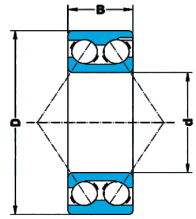
Double row
d10 - 95mm



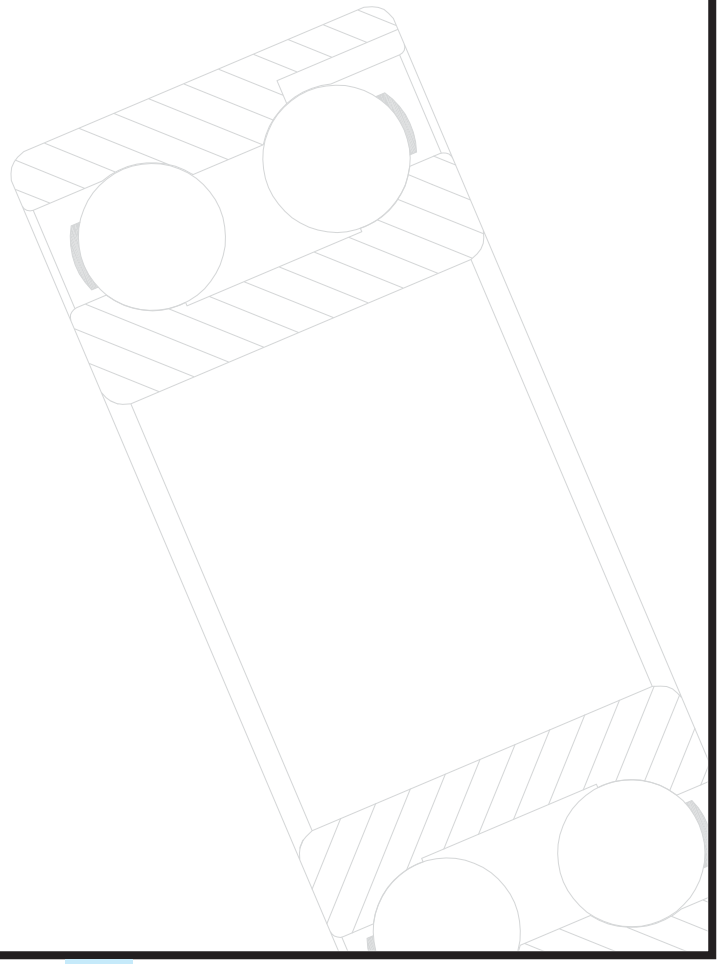
Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil	kg	
10	30	14	7.61	4.3	22000	24000	0.051	3200
12	32	15.9	10.1	5.6	20000	22000	0.058	3201
15	35	15.9	11.2	6.8	17000	18000	0.066	3202
	42	19	15.1	9.3	15000	16000	0.13	3302
17	40	17.5	14.3	8.8	15000	16000	0.096	3203
	47	22.2	21.6	12.7	14000	14000	0.18	3303
20	47	20.6	20	12	14000	14000	0.16	3204
	52	22.2	23.6	14.6	13000	13000	0.22	3304
25	52	20.6	21.6	14.3	12000	12000	0.18	3205
	62	25.4	32	20.4	11000	11000	0.35	3305
30	62	23.8	30	20.4	10000	10000	0.29	3206
	72	30.2	41.5	27.5	9000	9000	0.53	3306
35	72	27	40	28	9000	9000	0.44	3207
	80	34.9	52	35.5	8500	8500	0.71	3307
40	80	30.2	47.5	34	8000	8000	0.58	3208
	90	36.5	64	44	7500	7500	1.05	3308
45	85	30.2	51	39	7500	7500	0.63	3209
	100	39.7	75	53	6700	6700	1.40	3309
50	90	30.2	51	39	7000	7000	0.66	3210
	110	44.4	90	64	6000	6000	1.95	3310
55	100	33.36	60	47.5	6300	6300	1.05	3211
	120	49.2	112	81.5	5300	5300	2.55	3311
60	110	36.5	73.5	58.5	5600	5600	1.4	3212
	130	54	127	95	5000	5000	3.25	3312
65	120	38.1	80.6	73.5	4500	4800	1.75	3213
	140	58.7	146	110	4500	4500	4.10	3313
70	125	39.7	88.4	80	4300	4500	1.90	3214
	150	63.5	153	125	4000	4000	5.05	3314M
75	130	41.3	95.6	88	4300	4500	2.10	3215
	160	68.3	176	140	4000	4000	5.55	3315M
80	140	44.4	106	95	4000	4300	2.65	3216
	170	68.3	182	156	3400	3600	6.80	3316M
85	150	49.2	124	110	3600	3800	3.40	3217
	180	73	195	176	3200	3400	8.30	3317M
90	160	52.4	130	120	3400	3600	4.15	3218M
	190	73	195	180	3000	3200	9.25	3318M

Angular Contact Ball Bearing

Double row
d100 - 110mm

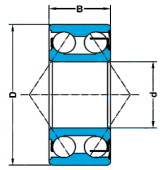


Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil	kg	
95	170	55.6	159	146	3200	3400	5.00	3219M
	200	77.8	225	216	2800	3000	11.0	3319M
100	180	60.3	178	166	3000	3200	6.10	3220M
	215	82.6	255	255	2600	2800	11.0	3320M
110	200	69.8	212	212	2800	2800	8.80	3222M
	240	92.1	291	305	2400	2600	19.0	3322M

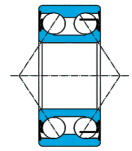


Angular Contact Ball Bearings

Sealed double row
d10 - 75mm



RS

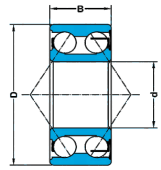


2RS

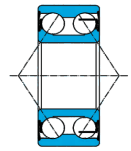
Principal Dimensions			Basic Load Ratings		Limiting speeds Bearing with		Mass	Designation[1] Bearing with	
d	D	B	Dynamic C	Static C_0	Shields	Seals		Shields	Seals
mm			kN		r/min		kg		
10	30	14	7.61	4.3	24000	17000	0.051	3200-2Z	3200-2RS
12	32	15.9	10.1	5.6	22000	15000	0.058	3201-2Z	3201-2RS
15	35	15.9	11.2	6.8	18000	14000	0.066	3202-2Z	3202-2RS
	42	19	15.1	9.3	16000	12000	0.13	3302-2Z	3302-2RS
17	40	17.5	14.3	8.8	16000	12000	0.10	3203-2Z	3203-2RS
	47	22.2	21.6	12.7	14000	11000	0.18	3303-2Z	3303-2RS
20	47	20.6	20	12	14000	10000	0.16	3204-2Z	3204-2RS
	52	22.2	23.6	14.6	13000	9000	0.22	3304-2Z	3304-2RS
25	52	20.6	21.6	14.3	12000	8500	0.18	3205-2Z	3205-2RS
	62	25.4	32	20.4	11000	7500	0.35	3305-2Z	3305-2RS
30	62	23.8	30	20.4	10000	7500	0.29	3206-2Z	3206-2RS
	72	30.2	41.5	27.5	9000	6300	0.52	3306-2Z	3306-2RS
35	72	27	40	28	9000	6300	0.44	3207-2Z	3207-2RS
	80	34.9	52	35.5	8500	6000	0.73	3307-2Z	3307-2RS
40	80	30.2	47.5	34	8000	5600	0.57	3208-2Z	3208-2RS
	90	36.5	64	44	7500	5000	0.93	3308-2Z	3308-2RS
45	85	30.2	51	39	7500	5300	0.63	3209-2Z	3209-2RS
	100	39.7	75	53	6700	4800	1.25	3309-2Z	3309-2RS
50	90	30.2	51	39	7000	4800	0.65	3210-2Z	3210-2RS
	110	44.4	90	64	6000	4300	1.70	3310-2Z	3310-2RS
55	100	33.3	60	47.5	6300	4500	0.91	3211-2Z	3211-2RS
	120	49.2	112	81.5	5300	3800	2.65	3311-2Z	3311-2RS
60	110	36.5	73.5	58.5	5600	4000	1.20	3212-2Z	3212-2RS
	130	54	127	95	5000	3500	2.80	3312-2Z	3312-2RS
65	120	38.1	80.6	73.5	4800	3600	1.75	3213-2Z	3213-2RS
	140	58.7	146	110	4500	3200	4.10	3313-2Z	3313-2RS
70	125	39.7	88.4	80	4500	3000	1.90	3214-2Z	3214-2RS
	150	63.5	153	125	4000	2600	5.05	3314-2Z	3314-2RS
75	130	41.3	95.6	88	4500	3000	2.10	3215-2Z	3215-2RS
	160	68.3	176	140	4000	2600	5.60	3315-2Z	3315-2RS

Angular Contact Ball Bearings

Double row with Shield
d10 - 70mm



RS



2RS

Principal Dimensions			Basic Load Ratings		Speed Ratings Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_o	Grease r/min	Oil	kg	Rubber Shield	Rubber Shield
10	30	14	7150	3900	16000	22000	0.045	5200 ZZTN	5200 2RS TN
12	32	15.90	10600	5850	15000	20000	0.050	5201 ZZTN	5201 2RS TN
15	35	15.90	11700	6950	12000	17000	0.068	5202 ZZTN	5202 2RS TN
17	40	17.50	14800	9000	10000	15000	0.090	5203 ZZTN	5203 2RS TN
20	47	20.60	19500	12200	9000	13000	0.14	5204 ZZTN	5204 2RS TN
	52	22.20	22500	14600	8500	12000	0.20	5304 ZZTN	5304 2RS TN
25	52	20.60	21200	14600	8000	11000	0.16	5205 ZZTN	5205 2RS TN
	62	25.40	30700	20400	7500	10000	0.32	5305 ZZTN	5305 2RS TN
30	62	23.80	29600	21200	7000	9500	0.26	5206 ZZTN	5206 2RS TN
	72	30.20	41600	29000	6300	8500	0.48	5306 ZZTN	5306 2RS TN
35	72	27	37700	27500	6000	8000	0.40	5207 ZZTN	5207 2RS TN
	80	34.90	49400	34500	5600	7500	0.66	5307 ZZTN	5307 2RS TN
40	80	30.20	44900	34000	5600	7500	0.53	5208 ZZTN	5208 2RS TN
	90	36.50	60500	43000	5000	6700	0.86	5308 ZZTN	5308 2RS TN
45	85	30.20	48.80	39.00	5000	6700	0.57	5209 ZZTN	5209 2RS TN
	100	39.70	72.80	53.00	4500	6000	1.15	5309 ZZTN	5309 2RS TN
50	90	30.20	48.80	39.00	4800	6300	0.59	5210 ZZTN	5210 2RS TN
	110	44.40	85.20	64.00	4000	5300	1.55	5310 ZZTN	5310 2RS TN
55	100	33.3	57.20	47.50	4300	5600	0.83	5211 ZZTN	5211 2RS TN
	120	49.2	106.00	81.50	3800	5000	2.00	5311 ZZTN	5311 2RS TN
60	110	36.5	70.20	58.50	3800	5000	1.10	5212 ZZTN	5212 2RS TN
	130	54.0	121.00	95.00	3400	4500	2.60	5312 ZZTN	5312 2RS TN
65	120	38.1	80.60	73.50	3600	4800	1.58	5213 ZZTN	5213 2RS TN
	140	58.7	138.00	108.00	3200	4300	3.30	5313 ZZTN	5313 2RS TN
70	125	39.7	88.40	80.00	3200	4300	1.50	5214 ZZTN	5214 2RS TN
	150	63.5	153.00	125.00	2800	3800	4.05	5314 ZZTN	5314 2RS TN

SABB

Self Aligning
Ball Bearings

Self Aligning Ball Bearing

SELF ALIGNING BALL BEARING

This type is recommended when the alignment of the shaft and housing is difficult. Since the contact angle is small the axial load capacity is low.
Self alignment ball bearing contains two rows of ball and common sphere race ways in outer ring.

- These bearings are useful in application where small deflection of shaft may our relative to housing.
- Self aligning ball bearing has lowest friction of all rolling bearing. So it allows running cooler even at high speed.
- Can carry radial load, but not suitable for axial loads.
- Usable for low or medium speed application.
- Available with cylindrical bore or In certain size with tapered bore.
- Self aligning ball bearings with tapered bore are available with adapter sleeve.
- These bearings are provided with an annular groove and lubrication holes in outer and Inner ring.
- These type are recommended when the alignment of the shaft and housing is difficult. Since the contact angle is small, the axial load capacity is low.

Misalignment

Self alignment ball bearing is designed in such a way that angular misalignment between inner and outer ring can be accommodate without effecting on bearing performance.

Permissible Misalignment

This permissible misalignment of self-aligning ball bearing is approximately 0.07 to 0.12 radian (40° to 70°) under normal loads. However, depending on the surrounding structure, such an angle may not be possible.

Series available:
Double row

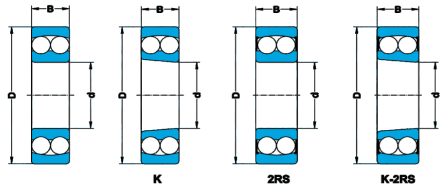
1200, 1300, 1400, 2200, 2300

ZNL Offering:-

Bore Diameter		Radial Internal Clearance							
d		C2		Normal		C3		C4	
over	Incl.	Min	Max	Min	Max	Min	Max	Min	Max
mm		Micron							
Bearing with cylindrical bore									
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

Self Aligning ball bearings

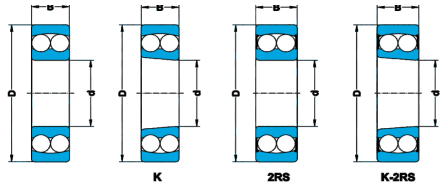
d5 - 25mm



Principal Dimensions			Load Ratings		Speed Rating		Mass	Designati
			Dynamic C	Static C_0	Grease	Oil	kg	
d mm	D	B	kN		RPM			
5	19	6	2.6	0.5	30000	36000	0.01	135
6	19	6	2.6	4.75	39500	36000	0.01	126
7	22	7	2.75	0.56	36500	36000	0.014	127
8	22	7	2.75	0.56	30000	36000	0.014	108
9	26	8	3.95	0.8	31500	32000	0.02	129
10	30	9	5.70	1.18	28500	30000	0.03	1200
	30	14	8.80	1.73	27500	28000	0.05	2200
12	32	10	5.70	1.26	27500	30000	0.04	1201
	32	14	9.40	1.92	24600	26000	0.05	2201
	32	14	5.70	1.26	16000	17000	0.058	2201.2RS
15	35	11	7.70	1.73	24800	26000	0.05	1202
	35	14	9.60	2.08	21100	24000	0.06	2202
	35	14	7.70	1.73	15000	--	0.06	2202.2RS
	42	17	17.00	3.7	18200	18000	0.11	2302
17	40	12	8.00	2	22300	22000	0.073	1203
	40	16	11.80	2.75	19600	19000	0.054	2203
	40	16	8.10	2	11000	14000	0.098	2203.2RS
	47	14	12.90	3.15	17900	18000	0.065	1303
	47	19	13.90	3.15	16900	17000	0.155	2303
	47	19	12.90	3.15	11000	--	0.18	2303.2RS
20	47	14	10.00	2.6	20200	18000	0.118	1204
	47	14	10.00	2.6	20200	18000	0.12	1204K
	47	18	14.70	3.5	17300	17000	0.134	2204
	47	18	10.00	2.6	11000	--	0.151	2204.2RS
	52	15	12.70	3.3	16200	16000	0.163	1304
	52	21	17.60	4.25	16000	15600	0.206	2304
	52	21	12.70	3.30	10000	--	0.23	2304.2RS
25	52	15	12.30	3.25	17800	16000	0.14	1205
	52	15	12.30	3.25	17800	16000	0.14	1205K
	52	18	17.30	4.4	14600	15000	0.16	2205
	52	18	17.30	4.4	14600	15000	0.16	2205K
	52	18	12.30	3.25	9500	--	0.16	2205.2RS
	52	18	12.20	3.35	9500	--	0.16	2205.2RS
	62	17	18.30	4.95	13900	14000	0.258	1305
	62	17	18.30	4.95	13900	14000	0.254	1305K
	62	24	25.00	6.5	13500	13000	0.335	2305

Self Aligning ball bearings

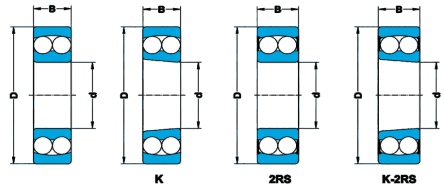
d25 - 50mm



Principal Dimensions			Load Ratings		Speed Rating		Mass	Designation
			Dynamic C	Static C_0	Grease	Oil		
d mm	D	B	kN		RPM		kg	
25	62	24	25.00	6.5	13500	13000	0.37	2305K
	62	24	18.30	4.95	8000	--	0.37	2305.2RS
30	62	16	15.90	4.6	14900	14000	0.22	1206
	62	16	15.90	4.6	14900	14000	0.22	1206K
	62	20	26.00	6.9	12600	12000	0.25	2206
	62	20	26.00	6.9	12600	12000	0.25	2206K
	62	20	15.90	4.6	8000	--	0.268	2206K.2RS
	62	20	15.90	4.6	8000	--	0.274	2206.2RS
	72	19	21.70	6.3	12300	11000	0.384	1306
	72	19	21.70	6.3	12300	11000	0.379	1306K
	72	27	32.50	8.7	11900	10000	0.48	2306
	72	27	32.50	8.7	11900	10000	0.476	2306K
	72	27	21.70	6.3	6700	--	0.55	2306.2RS
35	72	17	16.00	5.1	12900	12000	0.33	1207
	72	17	16.00	5.1	12900	12000	0.33	1207K
	72	23	33.00	8.9	11400	9500	0.4	2207
	72	23	33.00	8.9	11400	9500	0.4	2207K
	72	23	16.00	5.2	7000	--	0.432	2207.2RS
	72	23	16.00	5.2	7000	--	0.4	2207.2RS
	80	21	25.50	7.8	11300	9500	0.507	1307
	80	21	25.50	7.8	11300	9500	0.5	1307K
	80	31	40.50	11.2	11200	9000	0.975	2307
	80	31	40.50	11.2	11200	9000	0.96	2307K
	80	31	25.50	7.8	6000	--	0.74	2307.2RS
40	80	18	19.30	6.5	11600	10000	0.42	1208
	80	18	19.30	6.5	11600	10000	0.42	1208K
	80	23	32.50	9.4	9900	9000	0.476	2208
	80	23	32.50	9.4	9900	9000	0.465	2208K
	80	23	19.40	6.5	6300	--	0.517	2208K.2RS
	80	23	19.40	6.5	6300	--	0.528	2208.2RS
	90	23	30.00	9.6	10300	8500	0.708	1308
	90	23	30.00	9.6	10300	8500	0.698	1308K
45	85	23	22.00	7.3	5600	--	0.53	2209K.2RS
	85	23	22.00	7.35	5600	--	0.548	2209.2RS
50	110	27	42.00	14.1	8800	6700	1.54	1310
	110	27	42.00	14.1	8800	6700	1.52	1310K

Self Aligning ball bearings

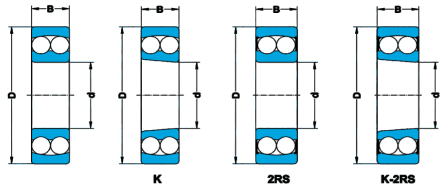
d50 - 65mm



Principal Dimensions			Load Ratings		Speed Rating		Mass	Designation
			Dynamic C	Static C_0	Grease	Oil		
d mm	D	B	kN		RPM		kg	
50	110	40	66.00	19.9	8800	6300	1.64	2310
	110	40	42.00	14.1	4300	*	1.82	2310.2RS
	90	20	22.80	8.15	10300	8500	0.53	1210
	90	20	22.80	8.15	10300	8500	0.53	1210K
	90	23	28.50	9.5	8300	8000	0.55	2210
	90	23	28.50	9.5	8300	8000	0.54	2210K
	90	23	22.80	8.15	5300	*	0.6	2210K.2RS
	90	23	22.80	8.15	5300	*	0.6	2210.2RS
55	100	21	27.00	10	9400	7500	0.69	1211
	100	21	27.00	10	9400	7500	0.682	1211K
	100	25	39.00	12.5	7700	6700	0.75	2211
	100	25	39.00	12.5	7700	6700	0.73	2211K
	100	25	27.00	10	4800	*	0.8	2211K.2RS
	100	25	27.00	10	4800	*	0.8	2211.2RS
	120	29	52.00	17.7	8300	6000	1.57	1311
	120	29	52.00	17.7	8300	6000	1.55	1311K
	120	43	77.00	23.8	8200	5600	2.07	2311
	120	43	77.00	23.8	8200	5600	2.3	2311K
60	110	22	30.50	11.6	8600	6700	0.89	1212
	110	22	30.50	11.6	8600	6700	0.88	1212K
	110	28	48.00	16.3	7400	6300	1.06	2212
	110	28	48.00	16.3	7400	6300	1.03	2212K
	110	28	30.50	11.6	*	4300	1.13	2212K.2RS
	110	28	30.50	11.6	*	4300	1.13	2212.2RS
	130	31	58.00	20.8	7800	5300	1.97	1312
	130	31	58.00	20.8	7800	5300	1.94	1312K
	130	46	89.00	28	7800	5000	2.58	2312
	130	46	89.00	28	7800	5000	2.52	2312K
65	120	23	31.00	12.5	8000	6300	1.14	1213
	120	23	31.00	12.5	8000	6300	1.13	1213K
	120	31	58.00	19	7100	5300	1.36	2213
	120	31	58.00	19	7100	5300	1.33	2213K
	140	33	63.00	22.8	7400	5000	2.44	1313
	140	33	63.00	22.8	7400	5000	2.41	1313K
	140	48	98.00	32	7300	4800	3.23	2313

Self Aligning ball bearings

d70 - 85mm



Principal Dimensions			Load Ratings		Speed Rating		Mass	Designation
			Dynamic C	Static C_0	Grease	Oil		
d mm	D	B	kN		RPM		kg	
70	125	24	35.00	13.7	7700	6000	1.25	1214
	125	24	35.00	13.7	7700	6000	1.23	1214K
	125	31	44.00	16.9	6600	8500	1.69	2214
	150	35	75.00	27.5	7000	7000	3.22	1314
	150	35	75.00	27.5	4000	4800	3.1	1314K
	150	51	112.00	37.0	6900	6300	4.38	2314
	150	51	110.00	37.5	3600	4300	4.2	2314K
75	130	25	39.00	15.6	7500	5600	1.34	1215
	130	25	39.00	15.6	7500	5600	1.4	1215K
	130	31	44.50	17.6	6300	5300	1.6	2215
	130	31	44.50	17.6	6300	5300	1.6	2215K
	160	37	80.00	29.5	6700	6300	3.86	1315
	160	37	80.00	29.5	6700	6300	3.81	1315K
	160	55	124.00	42.0	6700	6000	5.33	2315
	160	55	124.00	42.0	6700	6000	5.2	2315K
80	140	26	40.00	16.8	7000	5000	1.65	1216
	140	26	40.00	16.8	7000	5000	1.62	1216K
	140	33	49.50	19.8	6000	5000	2.01	2216
	140	33	49.50	19.8	6000	5000	1.97	2216K
85	150	28	49.50	20.6	6800	4800	2.03	1217K
	150	36	59.00	23.5	5800	7000	2.79	2217
	150	36	59.00	23.5	5800	7000	2.6	2217K

Four Point Contact
Ball Bearings

Four Point Contact Ball Bearings

These bearings contains solid outer ring, split Inner ring and ball & cage assembly. Two plece Inner rings allow large complement of ball to accommodate.

Inner ring halves are matched to particular bearing and not be Interchanged with other bearing of same size.

The outer ring with ball & cage assembly can be Interchangeable. These bearings can carry high axial load in both direction, and also with small radial load. With or without retaining slots: quick and safety location, larger four point contact ball bearings have two retaining slots at 180. These bearings have suffix N2.

The Inner ring is splits radially into two pieces and this can sustain significant axial load in either direction the contact angle is 35 so axial load capacity is high this bearings is suitable for carrying pure axial load or combined load, where the axial load is high.

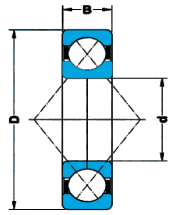
These bearings are not suitable for angular miss-alignment in housing or shaft deflection. These bearings are not sealed Series Available

QJ2XX, QJ3XX

Bore Diameter		Axial Internal Clearance							
d		C2		Normal		C3		C4	
over	Incl.	Min	Max	Min	Max	Min	Max	Min	Max
mm		Micron							
10	17	15	55	45	85	75	125	115	165
17	40	26	66	56	106	96	146	136	186
40	60	36	86	76	126	116	166	156	206
60	80	46	96	86	136	126	176	166	226
80	100	56	106	96	156	136	196	186	246
100	140	66	126	116	176	156	216	206	266
140	180	76	156	136	196	176	246	226	296
180	220	96	176	156	226	206	276	256	326

Four Point Contact ball bearings

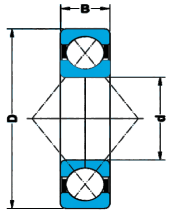
d15 - 100mm



Principal Dimensions			Basic Load Ratings		Fatigue Load Limit	Speed Ratings Lubrication		Mass	Designation Bearing with Locating Shield
			Dynamic	Static		Grease	Oil		
d mm	D	B	C kN	C_o kN	P_u kN	RPM		kg	
15	35	11	12.7	8.3	0.36	22000	36000	0.062	QJ 202
17	40	12	15.9	10.6	0.45	19000	30000	0.082	QJ 203
	47	14	23.4	15	0.64	17000	28000	0.14	QJ 303
20	52	15	29.6	20	0.85	15000	24000	0.18	QJ 304
25	52	15	25.1	20	0.83	14000	22000	0.16	QJ 205
	62	17	39	28	1.18	12000	20000	0.29	QJ 305
30	62	16	35.1	28.5	1.2	12000	19000	0.24	QJ 206
	72	19	49.4	38	1.63	10000	17000	0.42	QJ 306
35	72	17	46.2	39	1.63	10000	17000	0.36	QJ 207
	80	21	59.20	46.5	1.96	9500	15000	0.57	QJ 307
40	80	18	52.7	45	1.9	9000	15000	0.45	QJ 208
	90	23	71.5	58.5	2.45	8500	14000	0.78	QJ 308
45	85	19	58.5	51	2.16	8500	14000	0.52	QJ 209
	100	25	93.6	76.5	3.25	7500	12000	1.05	QJ 309
50	90	20	61.8	56	2.4	7500	13000	0.59	QJ 210
	110	27	111	91.5	3.9	6700	11000	1.35	QJ 310
55	100	21	79.30	76.5	3.2	7000	11000	0.77	QJ 211
	120	29	127	108	4.55	6000	10000	1.75	QJ 311
60	110	22	92.3	86.5	3.65	6300	10000	0.99	QJ 212
	130	31	146	125	5.3	5600	9000	2.15	QJ 312
65	120	23	104	104	4.4	5600	9000	1.20	QJ 213
	140	33	165	146	6.1	5300	8500	2.70	QJ 313
70	125	24	114	114	4.8	5600	9000	1.32	QJ 214
	150	35	186	166	6.7	4800	8000	3.15	QJ 314
75	130	25	117	122	5.2	5300	8500	1.45	QJ 215
	160	37	199	186	7.35	4500	7500	3.90	QJ 315
80	140	26	138	146	5.85	4800	8000	1.85	QJ 216
	170	39	216	208	8	4300	7000	4.60	QJ 316
85	150	28	148	160	6.2	4500	7500	2.25	QJ 217
	180	41	234	236	8.65	4000	6700	5.45	QJ 317
90	160	30	174	186	6.95	4300	7000	2.75	QJ 218
	190	43	265	285	10.2	3800	6300	6.45	QJ 318
95	170	32	199	212	7.8	4000	6700	3.35	QJ 219
	200	45	286	315	11	3600	6000	7.45	QJ 319
100	180	34	225	240	8.65	3800	6300	4.05	QJ 220
	215	47	307	340	11.6	3400	5600	9.30	QJ 320

Four Point Contact ball bearings

d110 - 200mm



Principal Dimensions			Basic Load Ratings		Fatigue Load Limit	Speed Ratings Lubrication		Mass	Designation Bearing with Locating Shield
			Dynamic	Static		Grease	Oil		
d mm	D	B	C kN	C_o kN	P_u kN	RPM		kg	
110	200	38	265	305	10.4	3400	5600	5.60	QJ 222
	240	50	390	475	15	3000	4800	12.5	QJ 322
120	215	40	286	340	11.2	3200	5000	6.95	QJ 224
	260	55	390	490	15	2800	4500	16.0	QJ 324
130	230	40	296	365	11.6	2800	4800	7.75	QJ 226
	280	58	423	560	16.6	2600	4000	19.5	QJ 326
140	250	42	325	440	13.2	2600	4300	9.85	QJ 228
	300	62	468	640	18.6	2400	3800	24.0	QJ 328
150	270	45	377	530	15.3	2400	4000	12.5	QJ 230
	320	65	494	710	19.6	2200	3600	29.0	QJ 330
160	290	48	423	620	17.6	2200	3800	15.5	QJ 232
	340	68	540	815	21.6	2000	3400	34.5	QJ 332
170	310	52	436	670	18.3	2200	3400	19.5	QJ 234
	360	72	618	965	25	1900	3200	41.5	QJ 334
180	320	52	449	710	19	2000	3400	20.5	QJ 236
	380	75	637	1020	26	1800	3000	47.5	QJ 336
190	400	78	702	1160	28.5	1700	2800	49.0	QJ 338
200	360	58	540	915	23.2	1800	3000	28.5	QJ 240

Thrust
Ball Bearings

Thrust Ball Bearing

Thrust Ball Bearing

Thrust ball bearings are classified into flat seats or aligning seats depending on the shape of the outer ring seat (Housing Washer). They can sustain axial load but no radical load.

Single Direction Thrust Ball Bearing

These bearings contain a shaft washer, a housing washer and a ball and cage thrust assembly and simple in mounting.

These bearings can carry axial load in one direction and hence locate shaft axially on one direction, & not suitable for any radial load.

Series available

511XX, 512XX, 513XX, 514XX etc

-Brass Cage Available
-Inch Tape Thrust Tape Ball Bearing Available.
Double direction thrust ball bearing
These bearing consist of one shaft washer; two housing washer and two balls and cage assembly.
These bearings are also mounting separable as per single direction thrust ball bearing.
These bearings can carry axial acting in both direction, and hence shaft in both direction, & not suitable for any radial load.

Series Available

522XX,523XX,524XX

CYLINDRICAL ROLLER THRUST BEARINGS

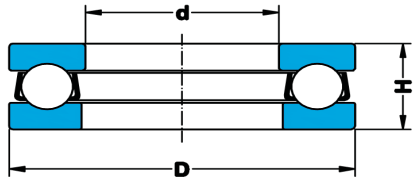
These bearings contain cylindrical roller and cage assembly, shaft washer and housing washer.
These bearings are suitably for heavy axial load shock load and are require less axial space.
Single direction bearings can carry axial load in one direction.
Double direction bearings can carry axial load in both direction.

Series Available

811XX, 812XX

Thrust Ball Bearings

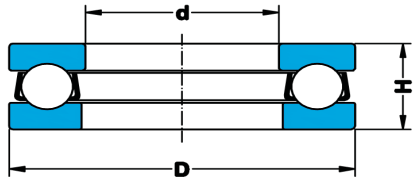
d10 - 65mm



Principal Dimensions			Basic Load Ratings		Fatigue Load Limit	Minimum Load Factor	Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static			Grease	Oil		
d mm	D	B	C kN	C_0	P_u kN	A	RPM		kg	
10	24	9	9.95	11.2	0.56	1.2	7900	10600	0.02	51100
12	26	9	10.4	12.3	0.62	1.4	7500	10000	0.022	51101
15	28	9	10.36	13.3	0.56	1.2	7100	9400	0.023	51102
	32	12	15.8	19.6	1	3.8	6000	7900	0.046	51202
17	30	9	11.4	15.5	0.62	1.4	7100	9400	0.025	51103
	35	12	16.2	21.1	1.1	4.7	5600	7500	0.053	51203
20	35	10	15	21.1	0.85	2.7	6300	8400	0.038	51104
	40	14	22.5	29.9	1.53	8.5	5000	6700	0.08	51204
25	42	11	18.1	28.2	1.16	5.2	5300	7100	0.058	51105
	47	15	27.6	39.8	2.04	15	4500	6600	0.11	51205
	52	18	35.5	49.2	2.24	18	3800	5000	0.17	51305
	60	24	55.3	70.8	3.6	48	3200	4200	0.34	51405
30	47	11	18.8	31.6	1.34	6.7	5000	6700	0.068	51106
	52	16	29.3	46.4	1.9	13	4000	5300	0.13	51206
	60	21	43	63.1	2.65	26	3300	4500	0.26	51306
	70	28	72.2	100	5.1	97	2700	3500	0.52	51406
35	52	12	20	36.9	1.53	8.5	4700	6300	0.08	51107
	62	18	39.1	61.9	2.7	28	3500	4700	0.22	51207
	68	24	55.2	84.1	3.55	48	2800	3800	0.38	51307
	80	32	87.4	123	6.2	150	2200	3000	0.79	51407
40	60	13	27.1	50.1	2.04	15	4200	5600	0.12	51108
	68	19	43.8	73.6	4	58	3200	4200	0.28	51208
	78	26	69.4	108	4.5	77	2700	3500	0.53	51308
	90	36	112	162	8.3	260	2000	2700	1.14	51408
45	65	14	27.6	55.2	2.28	19	4000	5300	0.14	51109
	73	20	46.4	82.5	3.2	38	3000	4000	0.3	51209
	85	28	79.4	131	5.6	120	2400	3200	0.66	51309
	100	39	131	192	9.8	370	1900	2500	1.4	51409
50	70	14	28.7	59.5	2.55	24	3800	5000	0.16	51110
	78	22	47.3	87.4	4.30	69	2800	3800	0.37	51210
55	78	16	34.8	73.6	3.10	37	3300	4500	0.23	51111
	90	25	69.4	126	5.4	110	2500	3300	0.59	51211
	120	48	207	316	14.3	790	1600	2100	2.64	51411
60	85	17	41.4	89.1	3.8	54	3200	4200	0.29	51112
65	100	27	75	150	6	140	2400	3200	0.78	51213
	115	36	128	228	8.8	300	1800	2400	1.6	51313

Thrust Ball Bearings

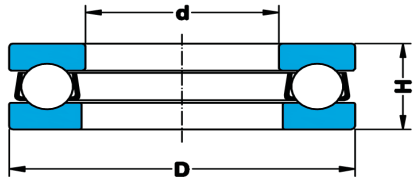
d70 - 200mm



Principal Dimensions			Basic Load Ratings		Fatigue Load Limit	Minimum Load Factor	Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static			Grease	Oil		
d mm	D	B	C kN	C_0 kN	P_u kN	A	RPM		kg	
70	95	18	43	100	4.15	65	2800	3800	0.35	51114
	105	27	76.4	158	6.4	160	2200	3000	0.79	51214
	125	40	147	271	11.8	530	1700	2200	2	51314
	150	60	251	438	19.3	1600	1200	1600	5.48	51414
75	100	19	43.8	108	5.5	110	2700	3500	0.4	51115
	110	27	77.9	165	6.8	170	2200	3000	0.83	51215
	135	44	185	341	14	790	1600	2100	2.6	51315
80	105	19	44.9	112	5.7	120	2700	3500	0.42	51116
	115	28	79.4	174	7.65	220	1300	2700	0.91	51216
	170	68	316	596	22.4	2300	890	1200	7.95	51416
85	110	19	45.9	119	6	140	2700	3500	0.44	51117
	150	49	224	414	16	1100	1300	1800	3.55	51317
90	120	22	59.2	150	7.5	220	2200	3000	0.67	51118
	155	50	233	447	16.6	1300	1100	1500	3.8	51318
	190	77	383	779	25.5	3500	790	1060	11.2	51418
100	135	25	85.2	215	10	440	2000	2700	0.97	51120
110	145	25	87.1	228	10.2	520	1900	2500	1.05	51122
	190	63	304	643	24	3200	890	1200	7.85	51322
	230	95	492	1120	34.5	7700	670	890	20	51422
120	155	25	89.1	228	10.6	580	1600	2100	1.15	51124
	170	39	140	440	13.4	1000	1100	1600	2.65	51224
	210	70	348	779	28.5	5000	790	1060	11	51324
	250	102	531	1260	36	9100	630	840	25.5	51424
130	170	30	119	322	12.9	940	1400	1900	1.85	51126
140	240	80	414	1000	35.5	9100	710	940	15.5	51328
150	190	31	123	355	12.5	1000	1300	1800	2.2	51130
160	200	31	126	376	12.9	1100	1300	1800	2.35	51132
	225	51	276	694	22.8	3800	890	1200	6.55	51232
170	215	34	158	464	14.3	1500	1200	1600	3.3	51134
	240	55	282	708	26	5400	840	1100	8.15	51234
180	225	34	165	54	15	1700	1100	1500	3.5	51136
	250	56	304	825	27.5	6100	840	1100	8.6	51236
190	240	37	185	573	18	2600	1060	1400	4.05	51138
	270	62	355	981	31	8400	750	1000	12.0	51238
200	250	37	188	584	17.6	2600	1060	1400	4.25	51140
	280	62	365	981	31.5	9100	750	1000	12.0	51240

Thrust Ball Bearings

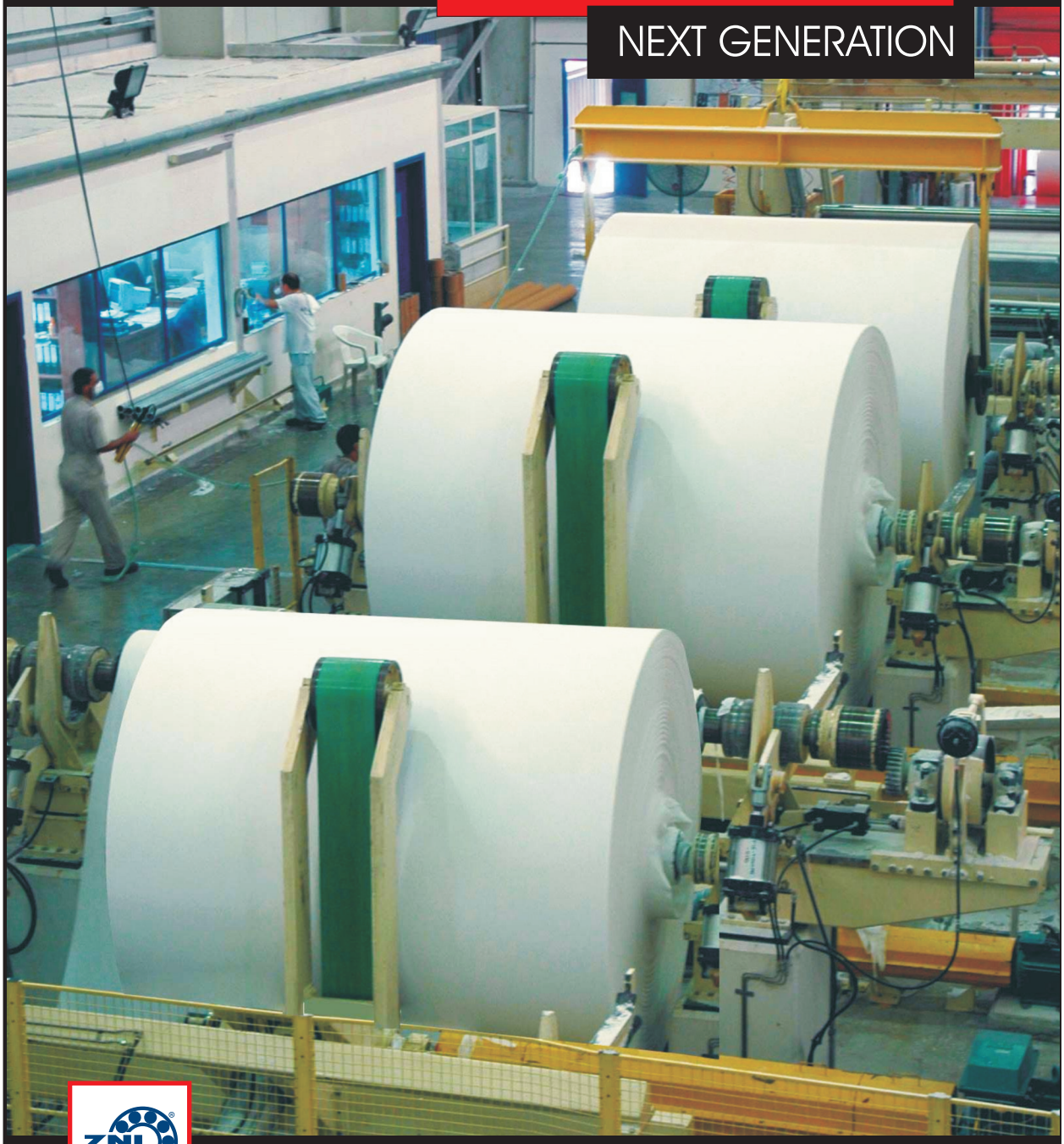
d220 - 240mm



Principal Dimensions			Basic Load Ratings		Fatigue Load Limit	Minimum Load Factor	Speed Ratings Lubrication		Mass	Designation
			Dynamic	Static			Grease	Oil	kg	
d mm	D	B	C kN	C_0	P_u kN	A	RPM			
220	270	37	192	643	19	3300	1000	1300	4.6	51144
240	300	45	261	825	23.6	5600	840	1100	7.55	51148

PAPER PLANT

NEXT GENERATION



Cylindrical
Roller Bearings

Cylindrical Roller Bearings

Cylindrical Roller Bearings

It contains cylindrical roller as rolling element.
It contains solid inner and outer rings, cylindrical roller and cage assembly.
The outer rings have rib on both side or no ribs.
The cylindrical roller bearings have high radical load carrying capacity, higher speed compared to full complement designed, Because of cage bearing with suffix E have higher load carrying capacity.
These bearings are separable in design.
Cylindrical roller bearing can accommodate heavy radical load at high speed.
For cylindrical roller bearing axial load carrying capacity is limited
Depending on the existence of ribs on their rings. Cylindrical roller Bearings are classified into the following types.
NU Design - Outer ring has two integral flanges, while inner ring had no flange.
N Design - Inner ring has two integral flanges while outer ring has no flange.
NJ Design - Outer ring has two integral flanges and inner ring has no integral flange.
NUP Design - Outer ring has two integral flanges and inner ring had one integral flange & loose flange ring for both side axial locations.

NU & N types are suitable as free – end bearings.
NJ type can sustain limited axial load in one direction.
NUP can be used as fixed – end bearing.

MORE SERIES AVAILABILITY : CRL, CRM, CFL,CFM
Available lin Steal, Brass and Polymide Cage.

Precautions for use of Cylindrical Roller Bearings.

It the load on cylindrical roller bearings becomes two small during operation then slippage between the rollers and raceway occurs. Which may result in smearing, espe cially with large bearing science the weight of roller and cage is high.

In case of vibration or strong shock loads, pressed steel cages are sometime inadequate.

Permissible Mis alignment.

The permissible misalignment of cylindrical roller bearing varies depending on the type and internal specifications but under normal loads. Permissible misalignment is below Cylindrical Rollar Bearing of width series 0 or 1…..0.0012 radian (4')

Cylindrical Rollar Bearing of width series 2….0.006radian (2'). For Double Row cylindrical roller bearings, mis alignment is not allowed.

Series Available

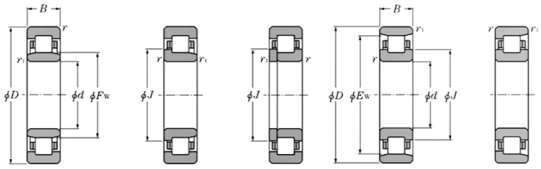
N2XX NF2XX NJ2XX NJ22XX NU2XX NU10XX NUP2XX NUP22XX
N3XX NF3XX NJ3XX NJ23XX NU3XX NU22XX NUP3XX NUP23XX
N4XX NF4XX NJ4XX NU4XX NU23XX NUP4XX

Radial internal clearance To DIN 620-4

Bore Diameter		Radial internal clearance					
d		CN		C3		C4	
over	incl.	Min	Max	Min	Mix	Min	Mix
mm		Micron					
	24	20	45	35	60	50	75
24	30	20	45	35	60	50	75
30	40	25	50	45	70	60	85
40	50	30	60	50	80	70	100
50	65	40	70	60	90	80	110
65	80	40	75	65	100	90	125
80	100	50	85	75	110	105	140
100	120	50	90	85	125	125	165
120	140	60	105	100	145	145	190
140	160	70	120	115	165	165	215
160	180	75	125	123	170	170	220
180	200	90	145	140	195	195	250
200	225	105	165	160	220	220	280
225	250	110	175	170	235	235	300
250	280	125	195	190	260	260	330

Cylindrical Roller Bearings

d15 - 40mm

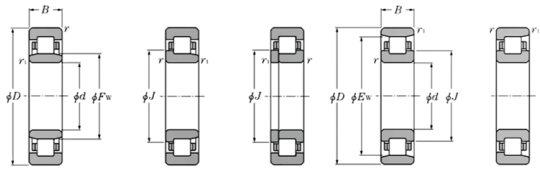


Type NU Type NJ Type NUP Type N Type NF

Boundry Dimension			Basic Load Ratings		Limiting Speeds[1)]		Bearing Numbers[2)]				Mass kg
mm			Dynamic kN	Static kN	min^{-1}		Type	Type	Type	Type	Type
d	D	B	C_r	C_{or}	Grease	Oil	NU	NJ	NUP	N	NU (approx.)
15	35	11	12	10	18000	20000	NU202E	NJ	NUP	-	0.048
17	40	12	17	14	16000	19000	NU203E	NJ	NUP	-	0.070
	40	16	23	21	16000	19000	NU2203E	NJ	NUP	-	0.095
	47	14	24	20	14000	17000	NU303E	NJ	NUP	-	0.120
20	47	14	25.7	22.6	15000	18000	NU204E	NJ	NUP	-	0.122
	47	18	30.5	28.3	14000	16000	NU2204E	NJ	NUP	-	0.158
	52	15	31.5	26.9	13000	15000	NU304E	NJ	NUP	-	0.176
	52	21	42	39	12000	14000	NU2304E	NJ	NUP	-	0.242
25	47	12	15.1	14.1	16000	19000	NU1005	NJ	NUP	N	0.092
	52	15	29.3	27.7	13000	15000	NU205E	NJ	NUP	-	0.151
	52	18	35	34.5	11000	13000	NU2205E	NJ	NUP	-	0.186
	62	17	41.5	37.5	11000	15000	NU305E	NJ	NUP	-	0.275
	62	24	57	56	9700	11000	NU2305E	NJ	NUP	-	0.386
	80	21	46.5	40	8500	10000	NU405	NJ	NUP	N	0.55
30	55	13	19.7	19.6	14000	16000	NU1006	NJ	NUP	N	0.13
	62	16	39	37.5	11000	13000	NU206E	NJ	NUP	-	0.226
	62	20	49	50	9700	11000	NU2206E	NJ	NUP	-	0.297
	72	19	53	50	9300	11000	NU306E	NJ	NUP	-	0.398
	72	27	74.5	77.5	8300	9700	NU2306E	NJ	NUP	-	0.58
	90	23	62.5	55	7300	8500	NU406	NJ	NUP	N	0.751
35	62	14	22.6	23.2	12000	15000	NU1007	NJ	NUP	N	0.179
	72	17	50.5	50	9500	11000	NU207E	NJ	NUP	-	0.327
	72	23	61.5	65.5	8500	10000	NU2207E	NJ	NUP	-	0.455
	80	21	71	71	8100	9600	NU307E	NJ	NUP	-	0.545
	80	31	99	109	7200	8500	NU2307E	NJ	NUP	-	0.78
	100	25	75.5	69	6400	7500	NU407	NJ	NUP	N	0.99
40	68	15	27.3	29	11000	13000	NU1008	NJ	NUP	N	0.22
	80	18	43.5	43	9400	11000	NU208	NJ	NUP	N	0.378
	80	18	55.5	55.5	8500	10000	NU208E	NJ	NUP	-	0.426
	80	23	58	62	8500	10000	NU2208	NJ	NUP	N	0.49
	80	23	72.5	77.5	7600	8900	NU2208E	NJ	NUP	-	0.552
	90	23	58.5	57	8000	9400	NU308	NJ	NUP	N	0.658
	90	23	83	81.5	7200	8500	NU308E	NJ	NUP	-	0.754
	90	33	82.5	88	7000	8200	NU2308	NJ	NUP	N	0.951
	90	33	114	122	6400	7500	NU2308E	NJ	NUP	-	1.06
	110	27	95.5	89	5700	6700	NU408	NJ	NUP	N	1.3

Cylindrical Roller Bearings

d45 - 60mm

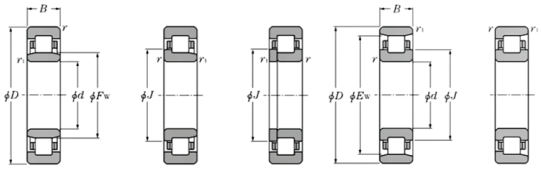


Type NU Type NJ Type NUP Type N Type NF

Boundry dimension			Basic Load Ratings		Limiting Speeds[1)]		Bearing Numbers[2)]					Mass kg
mm			Dynamic Static kN		min^{-1}		Type	Type	Type	Type	Type	Type
d	D	B	C_r	C_{or}	Grease	Oil	NU	NJ	NUP	N	NF	NU (approx.)
45	75	16	31	34.0	9 900	12 000	NU1009	NJ	NUP	N	-	0.28
	85	19	46	47.0	8 400	9 900	NU209	NJ	NUP	N	NF	0.432
	85	19	63	66.5	7 600	9 000	NU209E	NJ	NUP	-	-	0.495
	85	23	61.5	68.0	7 600	9 000	NU2209	NJ	NUP	N	-	0.53
	85	23	76	84.5	6 800	8 000	NU2209E	NJ	NUP	-	-	0.6
	100	25	74	71.0	7 200	8 400	NU309	NJ	NUP	N	NF	0.877
	100	25	97.5	98.5	6 500	7 600	NU309E	NJ	NUP	-	-	0.996
	100	36	99	104	6 300	7 400	NU2309	NJ	NUP	N	-	1.27
	100	36	137	153	5 700	6 800	NU2309E	NJ	NUP	-	-	1.41
	120	29	107	102	5 100	6 000	NU409	NJ	NUP	N	NF	1.62
50	80	16	32	36.0	8 900	11 000	NU1010	NJ	NUP	N	-	0.295
	90	20	48	51.0	7 600	9 000	NU210	NJ	NUP	N	NF	0.47
	90	20	66	72.0	6 900	8 100	NU210E	NJ	NUP	-	-	0.54
	90	23	64	73.5	6 900	8 100	NU2210	NJ	NUP	N	-	0.571
	90	23	79.5	91.5	6 200	7 300	NU2210E	NJ	NUP	-	-	0.652
	110	27	87	86.0	6 500	7 700	NU310	NJ	NUP	N	NF	1.14
	110	27	110	113	5 900	6 900	NU310E	NJ	NUP	-	-	1.3
	110	40	121	131	5 700	6 700	NU2310	NJ	NUP	N	-	1.7
	110	40	163	187	5 200	6 100	NU2310E	NJ	NUP	-	-	1.9
	130	31	129	124	4 700	5 500	NU410	NJ	NUP	N	NF	2.02
55	90	18	37.5	44.0	8 200	9 700	NU1011	NJ	NUP	N	-	0.442
	100	21	58	62.5	6 900	8 200	NU211	NJ	NUP	N	NF	0.638
	100	21	82.5	93.0	6 300	7 400	NU211E	NJ	NUP	-	-	0.718
	100	25	75.5	87.0	6 300	7 400	NU2211	NJ	NUP	N	-	0.773
	100	25	97	114	5 600	6 600	NU2211E	NJ	NUP	-	-	0.968
	120	29	111	111	5 900	7 000	NU311	NJ	NUP	N	NF	1.45
	120	29	137	143	5 300	6 300	NU311E	NJ	NUP	-	-	1.65
	120	43	148	162	5 200	6 100	NU2311	NJ	NUP	N	-	2.17
	120	43	201	233	4 700	5 600	NU2311E	NJ	NUP	-	-	2.37
	140	33	139	138	4 300	5 000	NU411	NJ	NUP	N	NF	2.48
60	95	18	40.0	48.5	7 500	8 800	NU1012	NJ	NUP	N	-	0.474
	110	22	68.5	75.0	6 400	7 600	NU212	NJ	NUP	N	NF	0.818
	110	22	97.5	107	5 800	6 800	NU212E	NJ	NUP	-	-	0.923
	110	28	96	116	5 800	6 800	NU2212	NJ	NUP	N	-	1.06

Cylindrical Roller Bearings

d60 - 75mm

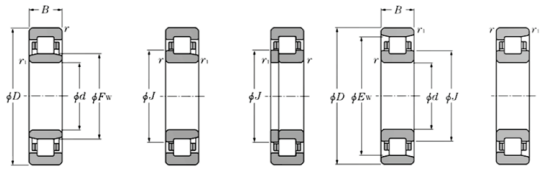


Type NU Type NJ Type NUP Type N Type NF

Boundry dimension			Basic Load Ratings		Limiting Speeds[1)]		Bearing Numbers[2)]					Mass kg
mm			Dynamic Static kN		min^{-1}		Type	Type	Type	Type	Type	Type
d	D	B	C_r	C_{or}	Grease	Oil	NU	NJ	NUP	N	NF	NU (approx.)
60	110	28	131	157	5 200	6 100	NU2212E	NJ	NUP	-	-	1.21
	130	31	124	126	5 500	6 500	NU312	NJ	NUP	N	NF	1.8
	130	31	150	157	4 900	5 800	NU312E	NJ	NUP	-	-	2.05
	130	46	169	188	4 800	5 700	NU2312	NJ	NUP	N	-	2.71
	130	46	222	262	4 400	5 200	NU2312E	NJ	NUP	-	-	2.96
	150	35	167	168	3 900	4 600	NU412	NJ	NUP	N	NF	3
65	100	18	41	51	7 000	8 200	NU1013	NJ	NUP	N	-	0.485
	120	23	84	94.5	5 900	7 000	NU213	NJ	NUP	N	NF	1.02
	120	23	108	119	5 400	6 300	NU213E	NJ	NUP	-	-	1.21
	120	31	120	149	5 400	6 300	NU2213	NJ	NUP	N	-	1.4
	120	31	149	181	4 800	5 600	NU2213E	NJ	NUP	-	-	1.6
	140	33	135	139	5 100	6 000	NU313	NJ	NUP	N	NF	2.23
	140	33	181	191	4 600	5 400	NU313E	NJ	NUP	-	-	2.54
	140	48	188	212	4 400	5 200	NU2313	NJ	NUP	N	-	3.27
	140	48	248	287	4 100	4 800	NU2313E	NJ	NUP	-	-	3.48
	160	37	182	186	3 600	4 300	NU413	NJ	NUP	N	NF	3.6
70	110	20	58.5	70.5	6 500	7 600	NU1014	NJ	NUP	N	-	0.699
	125	24	83.5	95	5 500	6 500	NU214	NJ	NUP	N	NF	1.12
	125	24	119	137	5 000	5 900	NU214E	NJ	NUP	-	-	1.3
	125	31	119	151	5 000	5 900	NU2214	NJ	NUP	N	-	1.47
	125	31	156	194	4 500	5 200	NU2214E	NJ	NUP	-	-	1.7
	150	35	158	168	4 700	5 500	NU314	NJ	NUP	N	NF	2.71
	150	35	205	222	4 200	5 000	NU314E	NJ	NUP	-	-	3.1
	150	51	223	262	4 100	4 800	NU2314	NJ	NUP	N	-	3.98
	150	51	274	325	3 800	4 400	NU2314E	NJ	NUP	-	-	4.25
	180	42	228	236	3 400	4 000	NU414	NJ	NUP	N	NF	5.24
75	115	22	60	74.5	6 100	7 100	NU1015	NJ	NUP	N	-	0.738
	130	25	96.5	111	5 100	6 000	NU215	NJ	NUP	N	NF	1.23
	130	25	130	156	4 700	6 500	NU215E	NJ	NUP	-	-	1.41
	130	31	130	162	4 700	5 500	NU2215	NJ	NUP	N	-	1.55
	130	31	162	207	4 200	4 900	NU2215E	NJ	NUP	-	-	1.79
	160	37	190	205	4 400	5 200	NU315	NJ	NUP	N	NF	3.28
	160	37	240	263	4 000	4 700	NU315E	NJ	NUP	-	-	3.74
	160	55	258	300	3 800	4 500	NU2315	NJ	NUP	N	-	4.87

Cylindrical Roller Bearings

d75 - 95mm

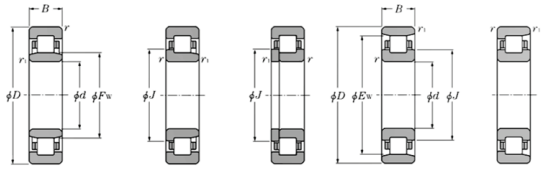


Type NU Type NJ Type NUP Type N Type NF

Boundry dimension			Basic Load Ratings		Limiting Speeds[1)]		Bearing Numbers[2)]					Mass kg
mm			Dynamic Static kN		min-1		Type	Type	Type	Type	Type	Type
d	D	B	C_r	C_{or}	Grease	Oil	NU	NJ	NUP	N	NF	NU (approx.)
75	160	55	330	395	3 500	4 100	NU2315E	NJ	NUP	-	-	5.25
	190	45	262	274	3 200	3 700	NU415	NJ	NUP	N	NF	6.22
80	125	22	72.5	90.5	5 700	6 700	NU1016	NJ	NUP	-	-	0.98
	140	26	106	122	4 800	5 700	NU216	NJ	NUP	N	NF	1.5
	140	26	139	167	4 400	5 100	NU216E	NJ	NUP	-	-	1.67
	140	33	147	186	4 400	5 100	NU2216	NJ	NUP	N	-	1.93
	140	33	186	243	3 900	4 600	NU2216E	NJ	NUP	-	-	2.12
	170	39	190	207	4 100	4 800	NU316	NJ	NUP	N	NF	3.86
	170	39	256	282	3 700	4 400	NU316E	NJ	NUP	-		4.22
	170	58	274	330	3 600	4 200	NU2316	NJ	NUP	N	NF	5.79
	170	58	355	430	3 300	3 900	NU2316E	NJ	NUP	-	-	6.25
	200	48	299	315	3 000	3 500	NU416	NJ	NUP	N	NF	7.32
85	130	22	74.5	95.5	5 400	6 300	NU1017	NJ	NUP	N	-	1.03
	150	28	120	140	4 500	6 300	NU217	NJ	NUP	N	NF	1.87
	150	28	167	199	4 100	4 800	NU217E	NJ	NUP	-	-	2.11
	150	36	170	218	4 100	4 800	NU2217	NJ	NUP	N	-	2.44
	150	36	217	279	3 700	4 300	NU2217E	NJ	NUP	-	-	2.68
	180	41	212	228	3 900	4 600	NU317	NJ	NUP	N	NF	4.54
	180	41	291	330	3 500	4 100	NU317E	NJ	NUP	-	-	4.81
	180	60	315	380	3 400	4 000	NU2317	NJ	NUP	N	-	6.7
	180	60	395	485	3 100	3 700	NU2317E	NJ	NUP	-	-	7.16
90	140	24	88	114	5 100	5 900	NU1018	NJ	NUP	N	-	1.33
	160	30	152	178	4 300	5 000	NU218	NJ	NUP	N	NF	2.3
	160	30	182	217	3 900	4 600	NU218E	NJ	NUP	-	-	2.44
	160	40	197	248	3 900	4 600	NU2218	NJ	NUP	N	-	3.1
	160	40	242	315	3 500	4 100	NU2218E	NJ	NUP	-	-	3.33
	190	43	240	265	3 700	4 300	NU318	NJ	NUP	N	NF	5.3
	190	43	315	355	3 300	3 900	NU318E	NJ	NUP	-	-	5.72
	190	64	325	395	3 200	3 800	NU2318	NJ	NUP	N	-	7.95
	190	64	435	535	2 900	3 400	NU2318E	NJ	NUP	-	-	8.56
95	145	24	90.5	120	4 800	5 600	NU1019	NJ	NUP	N	-	1.4
	170	32	166	195	4 000	4 700	NU219	NJ	NUP	N	NF	2.78
	170	32	220	265	3 600	4 300	NU219E	NJ	NUP	-	-	3.02

Cylindrical Roller Bearings

d95 - 120mm

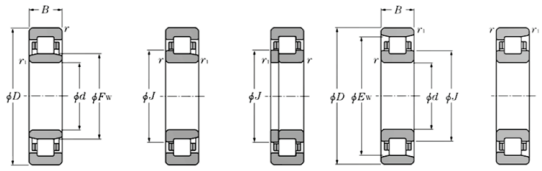


Type NU Type NJ Type NUP Type N Type NF

Boundry dimension			Basic Load Ratings		Limiting Speeds[1)]		Bearing Numbers[2)]					Mass kg
mm			Dynamic kN	Static kN	min^{-1}		Type	Type	Type	Type	Type	Type
d	D	B	C_r	C_{or}	Grease	Oil	NU	NJ	NUP	N	NF	NU (approx.)
95	170	43	230	298	3 600	4 300	NU2219	NJ	NUP	-	-	3.79
	170	43	286	370	3 300	3 800	NU2219E	NJ	NUP	N	NF	4.14
	200	45	259	285	3 400	4 000	NU319	NJ	NUP	-	-	6.13
	200	45	335	385	3 100	3 600	NU319E	NJ	NUP	N	NF	6.62
	200	67	370	460	3 000	3 500	NU2319	NJ	NUP	-	-	9.2
	200	67	460	585	2 700	3 200	NU2319E	NJ	NUP	N	NF	9.8
100	150	24	93	126	4 600	5 400	NU1020	NJ	NUP	-	-	1.45
	180	34	183	217	3 800	4 500	NU220	NJ	NUP	N	NF	3.33
	180	34	249	305	3 500	4 100	NU220E	NJ	NUP	-	-	3.66
	180	46	258	340	3 500	4 100	NU2220	NJ	NUP	N	-	4.57
	180	46	335	445	3 100	3 600	NU2220E	NJ	NUP	-	-	5.01
	215	47	299	335	3 300	3 800	NU320	NJ	NUP	N	NF	7.49
	215	47	380	425	2 900	3 500	NU320E	NJ	NUP	-		8.57
	215	73	410	505	2 900	3 400	NU2320	NJ	NUP	N	NF	11.7
	215	73	570	715	2 600	3 100	NU2320E	NJ	NUP	-	-	12.8
105	160	26	105	142	4 300	5 100	NU1021	NJ	NUP	N	-	1.84
	190	36	201	241	3 600	4 300	NU221	NJ	NUP	N	NF	3.95
	225	49	320	360	3 100	3 700	NU321	NJ	NUP	-	-	8.53
110	170	28	131	174	4 100	4 800	NU1022	NJ	NUP	-	-	2.33
	200	38	240	290	3 400	4 000	NU222	NJ	NUP	N	NF	4.63
	200	38	293	365	3 100	3 700	NU222E	NJ	NUP	-	-	4.27
	200	53	320	415	3 100	3 700	NU2222	NJ	NUP	N	-	6.56
	200	53	385	515	2 800	3 300	NU2222E	NJ	NUP	-	-	7.4
	240	50	360	400	3 000	3 500	NU322					10
	240	50	450	525	2 700	3 100	NU322E	NJ	NUP	N	-	11.1
	240	80	605	790	2 600	3 100	NU2322	NJ	NUP	N	NF	17.1
	240	80	675	880	2 400	2 800	NU2322E	NJ	NUP	-	-	19.4
120	180	28	139	191	3 800	4 400	NU1024	NJ	NUP	-	-	2.44
	215	40	260	320	3 200	3 700	NU224	NJ	NUP	N	NF	5.57
	215	40	335	420	2 900	3 400	NU224E	NJ	NUP	-	-	5.97
	215	58	350	460	2 900	3 400	NU2224	NJ	NUP	N	-	8.19
	215	58	450	620	2 600	3 000	NU2224E	NJ	NUP	-	-	9.18
	260	55	450	510	2 700	3 200	NU324	NJ	NUP	N	NF	12.8

Cylindrical Roller Bearings

d120 - 160mm

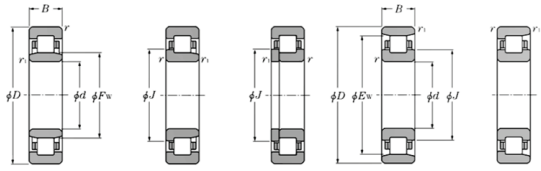


Type NU Type NJ Type NUP Type N Type NF

Boundry dimension			Basic Load Ratings		Limiting Speeds[1)]		Bearing Numbers[2)]					Mass kg
mm			Dynamic Static kN		min-1		Type	Type	Type	Type	Type	Type
d	D	B	C_r	C_{or}	Grease	Oil	NU	NJ	NUP	N	NF	NU (approx.)
120	260	55	530	600	2 400	2 800	NU324E	NJ	NUP	-	-	13.9
	260	86	710	900	2 400	2 800	NU2324	NJ	NUP	N	NF	21.5
	260	86	795	1230	2 200	2 500	NU2324E	NJ	NUP	-	-	26.1
130	200	33	172	238	3 400	4 000	NU1026	NJ	NUP	-	-	3.69
	230	40	270	340	2 900	3 400	NU226	NJ	NUP	N	NF	6.3
	230	40	365	455	2 600	3 100	NU226E	NJ	NUP	-	-	6.9
	230	64	380	530	2 600	3 100	NU2226	NJ	NUP	N	NF	10.2
	230	64	530	735	2 300	2 700	NU2226E	NJ	NUP	-	-	11.8
	280	58	560	655	2 500	2 900	NU326	NJ	NUP	N	NF	17.4
	280	58	615	735	2 200	2 600	NU326E	NJ	NUP	-	-	19.4
	280	93	840	1230	2 200	2 600	NU2326	NJ	NUP	N	NF	26.9
	280	93	920	1230	2 000	2 300	NU2326E	NJ	NUP	-	-	30.9
140	210	33	176	260	3 200	3 600	NU1028	NJ	NUP	-	-	4.05
	250	42	310	400	2 700	3 100	NU228	NJ	NUP	N	NF	7.88
	250	42	395	515	2 400	2 800	NU228E	NJ	NUP	-	-	8.73
	250	68	445	535	2 400	2 800	NU228	NJ	NUP	N	-	12.9
	250	68	575	535	2 100	2 500	NU2228E	NJ	NUP	-	-	15.8
	300	62	615	745	2 300	2 700	NU328	NJ	NUP	N	NF	21.2
	300	62	665	795	2 100	2 400	NU328E	NJ	NUP	-		23.2
	300	102	920	1250	2 000	2 300	NU2328	NJ	NUP	N	NF	33.8
	300	102	1020	1380	1 800	2 100	NU2328E	NJ	NUP	-	-	38.7
150	225	35	202	294	3 000	3 500	NU1030	NJ	NUP	-	-	4.77
	270	45	345	435	2 500	2 900	NU230	NJ	NUP	N	NF	9.92
	270	45	450	596	2 200	2 600	NU230E	NJ	NUP	-	-	11
	270	73	500	710	2 200	2 600	NU2230	NJ	NUP	N	-	16.3
	270	73	660	960	2 000	2 400	NU2230E	NJ	NUP	-	-	19.7
	320	65	665	806	2 100	2 500	NU330					25.3
	320	65	760	890	1 900	2 300	NU330E	NJ	NUP	N	-	28.4
	320	108	1020	1400	1 900	2 200	NU2330	NJ	NUP	N	NF	40.6
	320	108	1160	1600	1 700	2 000	NU2330E	NJ	NUP	-	-	47.2
160	240	38	238	340	2 800	3 300	NU1032	NJ	NUP	-	-	5.9
	290	48	430	570	2 300	2 700	NU232	NJ	NUP	N	NF	13.7
	290	48	500	665	2 100	2 400	NU232E	NJ	NUP	-	-	15.6

Cylindrical Roller Bearings

d160 - 200mm

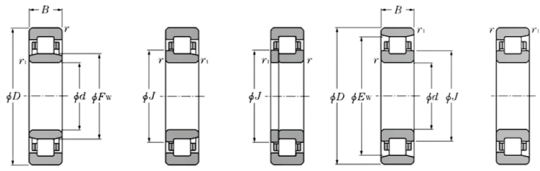


Type NU Type NJ Type NUP Type N Type NF

Boundry dimension			Basic Load Ratings		Limiting Speeds[1)]		Bearing Numbers[2)]					Mass kg
mm			Dynamic kN	Static kN	min^{-1}		Type	Type	Type	Type	Type	Type
d	D	B	C_r	C_{or}	Grease	Oil	NU	NJ	NUP	N	NF	NU (approx.)
160	290	80	630	940	2 100	2 400	NU2232	NJ	NUP	N	-	22
	290	80	810	1190	1 900	2 200	NU2232E	NJ	NUP	-	-	25.1
	340	68	700	875	2 000	2 300	NU332	NJ	NUP	N	NF	31.3
	340	68	860	1 050	1 800	2 100	NU332E	NJ	NUP	-	-	34
	340	114	1070	1 520	1 700	2 000	NU2332	NJ	NUP	N	-	50.5
	340	114	1310	1 820	1 600	1 900	NU2332E	NJ	NUP	-	-	56
170	260	42	278	400	2 600	3 000	NU1034	NJ	NUP	N	-	7.88
	310	52	475	635	2 200	2 500	NU234	NJ	NUP	N	NF	17
	310	52	605	800	2 000	2 300	NU234E	NJ	NUP	-	-	19.6
	310	86	715	1 080	2 000	2 300	NU2234	NJ	NUP	N	-	27.2
	310	86	965	1 410	1 800	2 100	NU2234E	NJ	NUP	-	-	31
	360	72	795	1 010	1 800	2 200	NU334	NJ	NUP	N	NF	37
	360	120	1220	1 750	1 600	1 900	NU2334	NJ	NUP	N	-	59.5
180	280	46	340	485	2 400	2 900	NU1036	NJ	NUP	N	-	10.3
	320	52	495	675	2 000	2 400	NU236	NJ	NUP	N	NF	17.7
	320	52	625	850	1 800	2 200	NU236E	NJ	NUP	-	-	20.4
	320	86	745	1 140	1 800	2 200	NU2236	NJ	NUP	N	-	28.4
	320	86	1010	1 510	1 600	1 900	NU2236E	NJ	NUP	-	-	31.9
	380	75	905	1 150	1 700	2 000	NU336	NJ	NUP	N	NF	44.2
	380	126	1380	1 990	1 500	1 800	NU2336	NJ	NUP	N	-	69.5
190	290	46	350	510	2 300	2 700	NU1038	NJ	NUP	N	-	10.7
	340	55	555	770	1 900	2 200	NU238	NJ	NUP	N	NF	21.3
	340	55	695	955	1 700	2000	NU238E	NJ	NUP	-	-	24.2
	340	92	830	1 290	1 700	2000	NU2238	NJ	NUP	N	-	34.4
	340	92	1100	1 670	1 500	1 800	NU2238E	NJ	NUP	-	-	39.5
	400	78	975	1 260	1 600	1 900	NU338	NJ	NUP	N	NF	49.4
	400	132	1520	2 220	1 400	1 700	NU2338	NJ	NUP	N	-	80.5
200	310	51	390	580	2 200	2 600	NU1040	NJ	NUP	N	-	13.9
	360	58	620	865	1 800	2 100	NU240	NJ	NUP	N	NF	25.3
	360	58	765	1 060	1 600	1 900	NU240E	NJ	NUP	-	-	28.1
	360	98	925	1 440	1 600	1 900	NU2240	NJ	NUP	N	-	41.3
	360	98	1220	1 870	1 500	1 700	NU2240E	NJ	NUP	-	-	47.8
	420	80	975	1 270	1 500	1 800	NU340	NJ	NUP	N	NF	55.8
	420	138	1 510	2 240	1 400	1 600	NU2340	NJ	NUP	N	-	92.6

Cylindrical Roller Bearings

d220 - 500mm

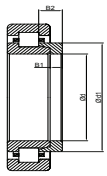


Type NU Type NJ Type NUP Type N Type NF

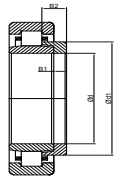
Boundry dimension			Basic Load Ratings		Limiting Speeds[1)]		Bearing Numbers[2)]					Mass kg
mm			Dynamic Static kN		min^{-1}		Type	Type	Type	Type	Type	Type
d	D	B	C_r	C_{or}	Grease	Oil	NU	NJ	NUP	N	NF	NU (approx.)
220	340	56	500	750	2 000	2 300	NU1044	NJ	NUP	N	-	18.2
	400	65	760	1080	1 600	1 900	NU244	NJ	NUP	-	-	37.7
	400	108	1 140	1 810	1 500	1 700	NU2244	NJ	NUP	N	NF	59
	460	88	1 190	1 570	1 400	1 600	NU344	NJ	NUP	-	-	73.4
	460	145	1 780	2 620	1 200	1 400	NU2344	NJ	NUP	N	-	116
240	360	56	530	820	1 800	2 100	NU1048	NJ	NUP	N	-	19.6
	440	72	935	1 340	1 500	1 700	NU248	NJ	NUP	N	NF	50.2
	440	120	1 440	2 320	1 300	1 600	NU2248	NJ	NUP	-	-	80
	500	95	1 430	1 950	1 300	1 500	NU348	NJ	NUP	N	-	93.4
	500	155	2 100	3 200	1 100	1 300	NU2348	NJ	NUP	-	-	147
260	400	65	645	1 000	1 600	1 900	NU1052	NJ	NUP	N	-	29.1
	480	80	1 150	1 660	1 300	1 600	NU252	NJ	NUP	N	NF	66.9
	480	130	1 780	2 930	1 200	1 400	NU2252	NJ	NUP	-	-	104
	540	102	1 620	2 230	1 200	1 400	NU352	NJ	NUP	N	-	117
	540	165	2 340	3 600	1 000	1 200	NU2352	NJ	NUP	-	-	182
280	420	65	660	1 050	1 500	1 800	NU1056	NJ	NUP	N	-	30.9
	500	80	1 190	1 760	1 200	1 400	NU256	NJ	NUP	N	NF	70.8
	500	130	1 840	3 100	1 100	1 300	NU2256	NJ	NUP	-	-	109
	580	108	1 820	2 540	1 100	1 200	NU356	NJ	NUP	N	-	142
	580	175	2 700	4 250	920	1 100	NU2356	NJ	NUP	-	-	222
300	460	74	855	1 340	1 400	1 600	NU1060	NJ	NUP	N	-	43.6
	540	85	1 400	2 070	1 100	1 300	NU260	NJ	NUP	N	NF	88.2
	540	140	2 180	3 650	1 000	1 200	NU2260	NJ	NUP	-	-	138
320	480	74	875	1 410	1 300	1 600	NU1064	NJ	NUP	N	-	46
	580	92	1 600	2 390	1 000	1 200	NU264	NJ	NUP	N	NF	111
	580	150	2 550	4 350	950	1 100	NU2264	NJ	NUP	-	-	172
340	520	82	1 050	1 670	1 200	2 400	NU1068	NJ	NUP	N	-	61.8
360	540	82	1 080	1 750	1 100	2 300	NU1072	NJ	NUP	N	-	64.7
380	560	82	1 100	1 840	1 100	1 200	NU1076	NJ	NUP	N	-	67.5
400	600	90	1 320	2 190	990	1 200	NU1080	NJ	NUP	N	-	87.6
420	620	90	1 350	2 290	950	1 100	NU1084	NJ	NUP	N	-	91
440	650	94	1 430	2 430	900	1 100	NU1088	NJ	NUP	N	-	105
460	680	100	1 540	2 630	850	1 000	NU1092	NJ	NUP	N	-	122
480	700	100	1 580	2 750	810	960	NU1096	NJ	NUP	N	-	126
500	720	100	1 610	2 870	770	910	NU10/500	NJ	NUP	N	-	130

L Type Loose Rib

L type collar ring
d 20 - 55mm



NH=NJ+HJ



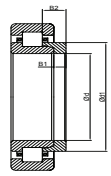
NUJ=NU+HJ

Dimensions				Bearing numbers	Mass
	mm				kg
d	d_1	B_1	B_2		(approx.)
20	29.9	3	6.75	HJ204	0.012
	29.5	3	5.5	HJ204E	0.009
	29.9	3	7.5	HJ2204	0.013
	29.5	3	6.5	HJ2204E	0.01
	31.8	4	7.5	HJ304	0.017
	31.1	4	6.5	HJ304E	0.014
	31.8	4	8.5	HJ2304	0.018
	31.1	4	7.5	HJ2304E	0.015
25	34.8	3	7.25	HJ205	0.015
	34.5	3	6	HJ205E	0.012
	34.8	3	7.5	HJ2205	0.015
	34.5	3	6.5	HJ2205E	0.013
	39	4	8	HJ305	0.025
	38	4	-	HJ305E	0.021
	39	4	9	HJ2305	0.027
	38	4	8	HJ2305E	0.024
	43.6	6	10.5	HJ405	0.057
30	41.7	4	8.25	HJ206	0.025
	41.1	4	7	HJ206E	0.017
	41.7	4	8.5	HJ2206	0.025
	41.1	4	7.5	HJ2206E	0.02
	45.9	5	9.5	HJ306	0.039
	44.9	5	8.5	HJ306E	0.035
	45.9	5	11.5	HJ2306	0.043
	44.9	5	9.5	HJ2306E	0.035
	50.5	7	11.5	HJ406	0.08
35	47.6	4	8	HJ207	0.03
	48	4	7	HJ207E	0.027
	47.6	4	8.5	HJ2207	0.031
	48	4	8.5	HJ2207E	0.031
	50.8	6	11	HJ307	0.056
	51	6	9.5	HJ307E	0.048
	50.8	6	14	HJ2307	0.064
	51	6	11	HJ2307E	0.055
	59	8	13	HJ407	0.12

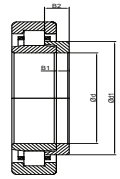
Dimensions				Bearing numbers	Mass
	mm				kg
d	d_1	B_1	B_2		(approx.)
40	54.2	5	9	HJ208	0.046
	53.9	5	8.5	HJ208E	0.042
	54.2	5	9.5	HJ2208	0.047
	53.9	5	9	HJ2208E	0.045
	58.4	7	12.5	HJ308	0.083
	57.6	7	11	HJ308E	0.07
	58.4	7	14.5	HJ2308	0.09
	57.6	7	12.5	HJ2308E	0.08
	64.8	8	13	HJ408	0.14
45	59	5	9.5	*HJ209	0.053
	58.9	5	8.5	HJ209E	0.047
	58.9	5	9	HJ2209E	0.05
	64	7	12.5	HJ309	0.099
	64.5	7	11.5	HJ309E	0.093
	64	7	15	HJ2309	0.109
	64.5	7	13	HJ2309E	0.103
	71.8	8	13.5	HJ409	0.175
50	64.6	5	10	HJ210	0.063
	63.9	5	9	*HJ210E	0.055
	64.6	5	9.5	HJ2210	0.061
	71	8	14	HJ310	0.142
	71.4	8	13	HJ310E	0.134
	71	8	17	HJ2310	0.157
	71.4	8	14.5	HJ2310E	0.15
	78.8	9	14.5	HJ410	0.23
55	70.8	6	11	*HJ211	0.084
	70.8	6	9.5	HJ211E	0.072
	70.8	6	10	HJ2211E	0.076
	77.2	9	15	HJ311	0.182
	77.7	9	14	HJ311E	0.168
	77.2	9	18.5	HJ2311	0.203
	77.7	9	15.5	HJ2311E	0.185
	85.2	10	16.5	HJ411	0.29

L Type Loose Rib

L type collar ring
d 60 - 95mm



NH=NJ+HJ



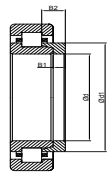
NUJ=NU+HJ

Dimensions				Bearing numbers	Mass
	mm				kg
d	d_1	B_1	B_2		(approx.)
60	78.4	6	11	* HJ212	0.108
	77.6	6	10	* HJ212E	0.094
	84.2	9	15.5	HJ312	0.22
	84.6	9	14.5	HJ312E	0.205
	84.2	9	19	HJ2312	0.245
	84.6	9	16	HJ2312E	0.23
	91.8	10	16.5	HJ412	0.34
65	84.8	6	11	HJ213	0.123
	84.5	6	10	HJ213E	0.111
	84.8	6	11.5	HJ2213	0.126
	84.5	6	10.5	HJ2213E	0.118
	91	10	17	HJ313	0.28
	91	10	15.5	HJ313E	0.25
	91	10	20	HJ2313	0.304
	91	10	18	HJ2313E	0.29
	98.5	11	18	HJ413	0.42
70	89.6	7	12.5	*HJ214	0.15
	89.5	7	11	HJ214E	0.13
	89.5	7	11.5	HJ2214E	0.138
	98	10	17.5	HJ314	0.33
	98	10	15.5	HJ314E	0.293
	98	10	20.5	HJ2314	0.358
	98	10	18.5	HJ2314E	0.35
	110.5	12	20	HJ414	0.605
75	94	7	12.5	*HJ215	0.156
	94.5	7	11	HJ215E	0.141
	94.5	7	11.5	HJ2215	0.164
	104.2	11	18.5	HJ315	0.4
	104.6	11	16.5	HJ315E	0.35
	104.2	11	21.5	HJ2315	0.432
	104.6	11	19.5	HJ2315E	0.41
	116	13	21.5	HJ415	0.71

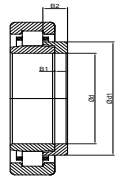
Dimensions				Bearing numbers	Mass
	mm				kg
d	d_1	B_1	B_2		(approx.)
80	101.2	8	13.5	*HJ216	0.207
	101.7	8	12.5	*H216E	0.193
	111.8	11	19.5	HJ316	0.47
	111	11	17	HJ316E	0.405
	111.8	11	23	HJ2316	0.511
	111	11	20	HJ2316E	0.45
	122	13	22	HJ416	0.78
85	108.2	8	14	*HJ217	0.25
	107.7	8	12.5	HJ217E	0.21
	107.7	8	13	HJ2217E	0.216
	117.5	12	20.5	HJ317	0.56
	118.4	12	18.5	HJ317E	0.505
	117.5	12	24	HJ2317	0.606
	118.4	12	22	HJ2317E	0.55
90	114.2	9	15	HJ218	0.305
	114.6	9	14	HJ218E	0.272
	114.2	9	16	HJ2218	0.315
	114.6	9	15	HJ2218E	0.308
	125	12	21	HJ318	0.63
	124.7	12	18.5	HJ318E	0.548
	125	12	26	HJ2318	0.704
	124.7	12	22	HJ2318E	0.69
95	121	9	15.5	HJ219	0.352
	121	9	14	HJ219E	0.304
	121	9	16.5	HJ2219	0.363
	121	9	15.5	HJ2219E	0.335
	132	13	22.5	HJ319	0.76
	132.7	13	20.5	HJ319E	0.7
	132	13	26.5	HJ2319	0.826
	132.7	13	24.5	HJ2319E	0.8

L Type Loose Rib

L type collar ring
d 100 - 180mm



NH=NJ+HJ



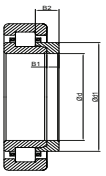
NUJ=NU+HJ

Dimensions				Bearing numbers	Mass
	mm				kg
d	d_1	B_1	B_2		(approx.)
	128	10	17	HJ220	0.444
	128	10	15	HJ220E	0.38
	128	10	18	HJ2220	0.456
	128	10	16	HJ2220E	0.385
100	140.5	13	22.5	HJ320	0.895
	140.3	13	20.5	HJ320E	0.8
	140.5	13	27.5	HJ2320	0.986
	140.3	13	23.5	HJ2320E	0.92
105	135.0	10	17.5	HJ221	0.505
	147	13	22.5	HJ321	0.97
	141.5	11	18.5	HJ222	0.615
	142.1	11	17	HJ222E	0.553
	141.5	11	20.5	HJ2222	0.645
110	142.1	11	19.5	HJ2222E	0.605
	155.5	14	23	HJ322	1.17
	156.6	14	22	HJ322E	1.09
	155.5	14	28	HJ2322	1.28
	156.6	14	26.5	HJ2322E	1.25
	153	11	19	HJ224	0.715
	153.9	11	17	HJ224E	0.634
	153	11	22	HJ2224	0.767
	153.9	11	20	HJ2224E	0.705
	168.5	14	23.5	HJ324	1.4
120	169.2	14	22.5	HJ324E	1.28
	168.5	14	28	HJ2324	1.53
	169.2	14	26	HJ2324E	1.42
	165.5	11	19	HJ226	0.84
	164.7	11	17	HJ226E	0.684
	165.5	11	25	HJ2226	0.953
	164.7	11	21	HJ2226E	0.831
130	182	14	24	HJ326	1.62
	183	14	23	HJ326E	1.53
	182	14	29.5	HJ2326	1.8
	183	14	28	HJ2326E	1.75

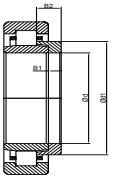
Dimensions				Bearing numbers	Mass
	mm				kg
d	d_1	B_1	B_2		(approx.)
	179.5	11	19	HJ228	1
	180.2	11	18	HJ228E	0.929
	179.5	11	25	HJ2228	1.14
	180.2	11	23	HJ2228E	1.11
140	196	15	26	HJ328	1.93
	196.8	15	25	HJ328E	1.91
	196	15	33.5	HJ2328	2.21
	196.8	15	31	HJ2328E	2.3
	193	12	20.5	HJ230	1.24
	194	12	19.5	HJ230E	1.18
	193	12	26.5	HJ2230	1.39
150	194	12	24.5	HJ2230E	1.42
	210	15	26.5	HJ330	2.37
	211	15	25	HJ330E	2.25
	210	15	34	HJ2330	2.69
	211	15	31.5	HJ2330E	2.6
	207	12	21	HJ232	1.48
	207.8	12	20	HJ232E	1.34
	207	12	28	HJ2232	1.69
	206.6	12	24.5	HJ2232E	1.61
160	225	15	28	HJ332	2.75
	223.2	15	25	HJ332E	2.4
	225	15	37	HJ2332	3.16
	223.2	15	32	HJ2332E	2.85
	220.5	12	22	HJ234	1.7
	221.4	12	20	HJ234E	1.51
	220.5	12	29	HJ2234	1.93
	220.2	12	24	HJ2234E	1.82
170	238	16	29.5	HJ334	3.25
	238	16	38.5	HJ2334	3.71
	230.5	12	22	HJ236	1.8
	231.4	12	20	HJ236E	1.7
	230.5	12	29	HJ2236	2.04
	230.2	12	24	HJ2236E	1.91
180	252	17	30.5	HJ336	3.85
	252	17	40	HJ336E	4.42

L Type Loose Rib

L type collar ring
d 190 - 320mm

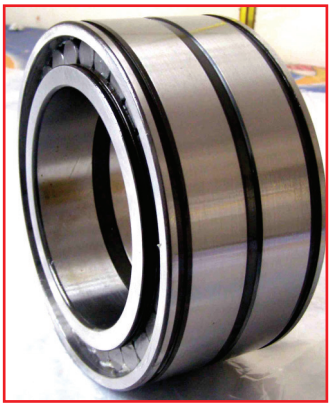


NH=NJ+HJ



NUJ=NU+HJ

Dimensions				Bearing numbers	Mass
	mm				kg
d	d_1	B_1	B_2		(approx.)
190	244.5	13	23.5	HJ238	2.2
	245.2	13	21.5	HJ238E	1.94
	244.5	13	31.5	HJ2238	2.52
	244	13	26.5	HJ2238E	2.38
	265	18	32	HJ338	4.45
	265	18	41.5	HJ2338	5.05
200	258	14	25	HJ240	2.6
	259	14	23	HJ240	2.35
	258	14	34	HJ2240	2.99
	257.8	14	28	HJ2240E	2.86
	280	18	33	HJ340	5
	280	18	44.5	HJ2340	5.76
220	286	15	27.5	HJ244	3.55
	307	20	36	HJ344	7.05
240	313	16	29.5	HJ248	4.65
	335	22	39.5	HJ348	8.2
260	340	18	33	HJ252	6.2
	362	24	43	HJ352	11.4
280	360	18	33	HJ256	7.39
	390	26	46	HJ356	13.9
300	387	20	34.5	HJ260	9.14
320	415	21	37	HJ264	11.3



Full Compliment Cylindrical Roller Bearings

Cylindrical Roller Bearings Full Complement

Full Compliment Cylindrical Roller Bearing

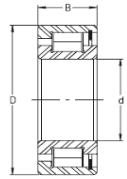
Full compliment bearings are suitable for heavy radial load.
This bearing contains solid outer and inner rings and rib guided cylindrical rollers.
These bearings have extremely high radial load carrying capacity.
These bearings available as locating, semi-locating and non-locating as well as single and double row design.
Compared to single row, double row cylindrical roller bearings are applicable for higher speed and greater accuracy. (In special application)
The outer ring without rib can be axially displaced in both directions relative to inner ring.
These bearings have lubrication groove and lubricating holes in outer ring.
These bearings can carry axial load in uni and bi-direction in addition to radial load.

With Snap Ring Grooves

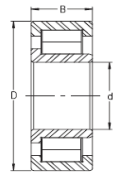
These bearing contains solid outer and inner ring with ribs, rib guided cylindrical roller and sealing rings.
The outer rings have grooves for retaining rings. Inner rings are Axial split,1 mm wider than outer ring and held together by rolled in steel strip.
These bearings can carry axial load in both direction as well as radial load.

Cylindrical Roller Bearings Full Complement, Single Row Semi-Locating Bearings

d20 - 75mm



SL18

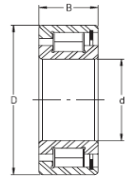


SL19

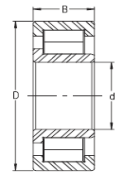
Principle Dimensions			Basic Load Ratings		Fatigue Load Limit	Limiting Speed	Mass	Designation
d mm	D	B	Dynamic C kN	Static C_0	P_u kN	RPM	kg	
20	42	16	30.5	26.5	4.45	10500	0.11	SL183004
	47	18	45.5	37.5	6.1	9700	0.16	SL182204
25	47	16	35	32.5	5.5	9000	0.12	SL183005
	52	18	51	45	7.4	8400	0.18	SL182205
	62	24	73	60	9.4	7400	0.37	SL192305
30	55	19	45	43	7.5	7600	0.2	SL183006
	62	20	70	65	10.2	7000	0.3	SL182206
	72	27	100	88	14.5	6400	0.56	SL192306
35	62	20	55	55	9.4	6700	0.26	SL183007
	72	23	88	79	12.7	6100	0.44	SL182207
	80	31	126	112	19	5600	0.74	SL192307
40	68	21	66	68	11.2	6000	0.31	SL183008
	80	23	97	93	14.9	5400	0.55	SL182208
	90	33	170	156	27	5000	1.01	SL192308
45	75	23	70	76	12.5	5400	0.4	SL183009
	85	23	101	99	16	5000	0.59	SL182209
	100	36	181	169	30	4450	0.37	SL192309
50	80	23	70	76	12.5	5400	0.43	SL183010
	90	23	109	113	18.1	4650	0.64	SL182210
	110	40	232	219	38.5	4050	1.81	SL192310
55	90	26	120	136	22.6	4450	0.64	SL183011
	100	25	140	150	25	4200	0.87	SL182211
	120	43	270	255	45.5	3700	2.28	SL192311
60	85	16	63	78	13.7	4450	0.29	SL182912
	95	26	123	145	23.7	4200	0.69	SL183012
	110	28	169	180	31	1800	1.18	SL182212
	130	46	285	280	50	3400	2.88	SL192312
	90	16	67	86	15.1	4200	0.31	SL182913
	100	26	130	159	26	3950	0.73	SL183013
65	120	31	198	214	37	3500	0.157	SL182213
	140	48	350	355	63	3150	3.52	SL192313
70	100	19	88	114	18.8	3800	0.49	SL182914
	110	30	153	176	29.5	3600	1.02	SL183014
	125	31	184	227	32	3300	1.66	SL182214
	150	51	385	390	69	2950	4.33	SL192314

Cylindrical Roller Bearings Full Complement, Single Row Semi-Locating Bearings

d75 - 150mm



SL18

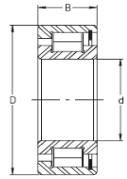


SL19

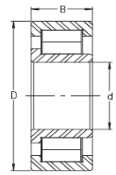
Principle Dimensions			Basic Load Ratings		Fatigue Load Limit	Limiting Speed	Mass	Designation
d mm	D	B	Dynamic C kN	Static C_0	P_u kN	RPM	kg	
75	105	19	91	121	20.1	3600	0.52	SL182915
	115	30	162	194	32.5	3400	1.06	SL183015
80	110	19	94	129	21.4	3400	0.55	SL182916
	125	34	173	225	31	3150	1.43	SL183016
	140	33	226	285	38.5	2950	2.15	SL182216
	170	58	540	560	96	2600	6.32	SL192316
85	120	22	118	162	25.5	3150	0.81	SL182917
	130	34	178	237	3.2	3000	1.51	SL183017
	150	36	255	325	44.5	2750	2.74	SL182217
	180	60	570	620	103	2450	7.34	SL192317
90	125	22	122	172	26.5	3000	0.84	SL182918
	140	37	208	280	38	2800	1.97	SL183018
	160	40	290	370	51	2600	3.48	SL182218
	190	64	620	660	112	2310	8.83	SL192318
95	130	22	132	179	27.5	2900	0.86	SL182919
	170	43	340	435	58	2450	4.17	SL182219
	200	67	650	720	120	2200	10.2	SL192319
100	140	24	152	206	31.5	2700	1.14	SL182920
	150	37	219	31	40.5	2600	2.15	SL183020
	180	46	395	520	70	2310	5.13	SL182220
	215	73	790	86	143	2060	13	SL192320
110	150	24	155	220	34	2490	1.23	SL182922
	170	45	285	395	52	2310	3.5	SL183022
	200	53	455	590	78	2090	7.24	SL182222
	240	80	950	980	156	1850	17	SL192322
120	165	27	199	295	45.5	2270	1.73	SL182924
	180	46	30	435	56	2160	3.8	SL183024
	215	58	540	730	95	1930	9.08	SL182224
	260	86	1130	1240	195	1710	22.3	SL192324
130	180	30	238	355	54	2090	2.33	SL182926
	200	52	435	620	79	1960	5.65	SL183026
	230	64	630	860	110	1800	11.25	SL182226
140	190	30	260	385	57	1960	2.42	SL182928
	210	53	455	680	85	1850	6.04	SL183028
	250	68	720	1020	127	1660	14.47	SL182228
150	210	36	340	490	73	1800	3.77	SL182930
	225	56	480	710	88	1730	7.33	SL183030

Cylindrical Roller Bearings Full Complement, Single Row Semi-Locating Bearings

d150 - 280mm



SL18



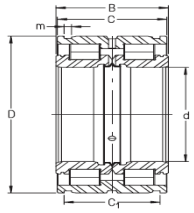
SL19

Principle Dimensions			Basic Load Ratings		Fatigue Load Limit	Limiting Speed	Mass	Designation
d mm	D	B	Dynamic C kN	Static C_0	P_u kN	RPM	kg	
150	270	73	830	1180	146	1540	18.43	SL182230
	220	36	350	520	77	1710	4	SL182932
160	240	60	550	820	99	1620	8.8	SL183032
	290	80	1030	1490	178	1440	23	SL182232
	130	31	190	241	33.5	3150	1.75	SL182215
	160	55	460	465	83	2750	5.3	SL192315
170	230	36	365	560	80	1620	4.3	SL182934
	260	67	710	1070	129	1510	12.2	SL183034
	310	86	1150	1680	199	1350	28.65	SL182234
180	250	42	455	690	100	1510	6.2	SL182936
	280	74	820	1260	149	1410	16.1	SL183036
	320	86	1190	1780	204	1300	29.8	SL182236
190	260	42	510	790	112	1440	6.5	SL182938
	290	75	840	1320	155	1350	17	SL183038
	340	92	1310	1920	223	1220	35.65	SL182238
200	250	24	183	330	33.5	1440	2.57	SL181840
	280	48	610	960	134	1350	9.1	SL182940
	310	82	960	1530	178	1270	21.8	SL183040
	360	98	1420	2040	235	1160	43.12	SL182240
220	270	24	192	365	36	1320	2.8	SL181844
	300	48	650	1050	144	1250	9.9	SL182944
	340	90	1160	1840	209	1160	28.4	SL183044
240	300	28	265	490	51	1200	4.29	SL181848
	320	48	610	1140	124	1160	10.6	SL182948
	360	92	1220	2010	224	1080	30.9	SL183048
260	320	26	275	530	54	1120	4.61	SL181852
	360	60	790	1470	160	1050	18.5	SL182952
	400	104	1620	2550	280	980	44.5	SL183052
280	350	33	355	670	69	1030	6.89	SL181856
	380	60	920	1740	184	980	19.7	SL182956
	420	106	1670	2700	290	930	48	SL183056

Cylindrical Roller Bearing Full Complement, Locating & Non - Locating Bearing

Double Row

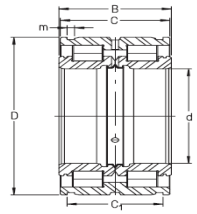
d60 - 340mm



Dimensions			Approx Weight	Basic Load Rating		Limiting Speed	Referance Speed	Locating Bearing	Non Locating Bearings
				Dynamic	Static				
d	D	B	kg	kN	kN				
60	85	25	0.48	71	125	4200	3000	SL014912	SL024912
70	100	30	0.75	108	189	3500	2600	SL014914	SL024914
80	110	30	0.85	115	211	3200	2200	SL014916	SL024916
90	125	35	1.3	155	295	2700	2000	SL014918	SL024918
100	140	40	1.9	196	380	2500	1800	SL014920	SL024920
110	150	40	2.1	204	410	2200	1600	SL014922	SL024922
120	165	45	2.85	228	455	2000	1500	SL014924	SL024924
130	180	50	3.8	265	530	1800	1400	SL014926	SL024926
140	190	50	4.1	275	570	1700	1300	SL014928	SL024928
150	210	60	6.5	415	840	1600	1200	SL014930	SL024930
150	190	40	2.8	237	550	1700	1200	SL014830	SL024830
160	200	40	3.1	243	580	1700	1100	SL014832	SL024832
160	220	60	6.9	435	900	1500	1000	SL014932	SL024932
170	215	45	4	265	620	1500	1000	SL014834	SL024834
170	230	60	7.2	445	950	1400	900	SL014934	SL024934
180	225	45	4.25	275	660	1400	1000	SL014836	SL024836
180	250	69	10.6	580	1230	1300	850	SL014936	SL024936
190	240	50	5.5	315	750	1300	1000	SL014838	SL024838
190	260	69	11	590	1290	1200	800	SL014938	SL024938
200	250	50	5.8	325	790	1200	900	SL014840	SL024840
200	280	80	15.5	690	1480	1100	750	SL014940	SL024940
220	270	50	6.3	340	870	1100	750	SL014844	SL024844
220	300	80	17	720	1590	1000	650	SL014944	SL024944
240	300	60	10	520	1290	1000	650	SL014848	SL024848
240	320	80	18	750	1740	950	600	SL014948	SL024948
260	320	60	10.8	540	1400	900	600	SL014852	SL024852
260	360	100	31.5	1120	2500	800	500	SL014952	SL024952
280	350	69	16	710	1860	850	500	SL014856	SL024856
280	380	100	33.5	1170	2700	800	500	SL014956	SL024956
300	380	80	22.5	830	2120	800	450	SL014860	SL024860
300	420	118	52.5	1650	3800	800	400	SL014960	SL024960
320	400	80	24	860	2280	800	400	SL014864	SL024864
320	440	118	55.5	1720	4100	750	350	SL014964	SL024964
340	420	80	25	880	2390	750	400	SL014968	SL024868
340	460	118	58	1770	4300	700	350	SL014968	SL024968

Cylindrical Roller Bearing Full Complement, Sealed

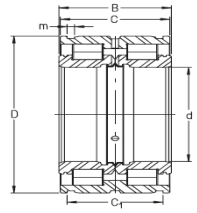
Double Row
d20 - 220mm



Principle Dimensions			Basic Load Ratings		Fatigue Load Limit	Limiting Speed	Mass	Designation
			Dynamic	Static				
d mm	D	B	C kN	C_0	P_u	RPM	Kg	
20	42	30	40.5	49	6.9	4000	0.2	SL045004-PP
25	47	30	44.5	58	8.1	3600	0.24	SL045005-PP
30	55	34	50	67	9.5	3000	0.37	SL045006-PP
35	62	36	63	88	12.4	2600	0.48	SL045007-PP
40	68	38	76	103	16.0	2400	0.56	SL045008-PP
45	75	40	92	130	19.9	2200	0.7	SL045009-PP
50	80	40	97	142	21.7	2000	0.76	SL045010-PP
55	90	46	115	175	25.5	1800	1.18	SL045011-PP
60	95	46	120	189	27.5	1700	1.26	SL045012-PP
65	100	46	125	203	29.5	1600	1.33	SL045013-PP
70	110	54	168	265	36.0	1400	1.87	SL045014-PP
75	115	54	194	300	42.0	1400	1.96	SL045015-PP
80	125	60	203	325	45.0	1300	2.71	SL045016-PP
85	130	60	211	350	47.5	1200	2.83	SL045017-PP
90	140	67	305	510	69.0	1100	3.71	SL045018-PP
95	145	67	315	530	71.0	1100	3.88	SL045019-PP
100	150	67	330	550	73.0	1000	3.95	SL045020-PP
110	170	80	395	680	89.0	900	6.57	SL045022-PP
120	180	80	410	740	94.0	900	7.04	SL045024-PP
130	200	95	540	960	122.0	800	10.5	SL045026-PP
130	190	80	430	790	99.0	800	7.5	SL04130-PP
140	210	95	610	1100	139.0	750	11.1	SL045028-PP
140	200	80	445	840	104.0	750	8	SL04140-PP
150	225	100	710	1260	156.0	700	13.3	SL045030-PP
150	210	80	465	920	111.0	700	8.4	SL04150-PP
160	240	109	740	1360	165.0	650	16.6	SL045032-PP
160	220	80	480	970	116.0	700	88	SL04160-PP
170	260	122	960	1750	212.0	600	22.6	SL045034-PP
170	230	80	490	1030	120.0	650	9.3	SL04170-PP
180	280	136	1140	2130	255.0	550	30.1	SL045036-PP
180	240	80	500	1080	125.0	600	9.8	SL04180-PP
190	290	136	1160	2210	260.0	550	31.5	SL045038-PP
190	260	80	520	1130	131.0	550	12.7	SL04190-PP
200	310	150	1350	2600	300.0	500	40.8	SL045040-PP
200	270	80	540	1210	136.0	550	13.2	SL04200-PP
220	340	160	1570	3050	350.0	480	52.5	SL045044-PP

Cylindrical Roller Bearing Full Complement, Sealed

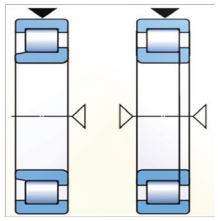
Double Row
d220 - 300mm



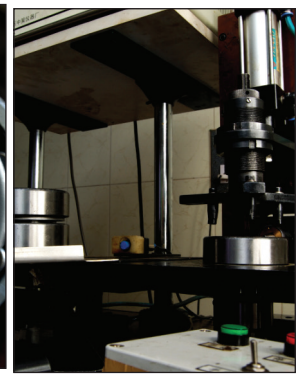
Principle Dimensions			Basic Load Ratings		Fatigue Load Limit	Limiting Speed	Mass	Designation
			Dynamic	Static				
d mm	D	B	C kN	C_0	P_u	RPN	Kg	
220	300	95	700	1550	174.0	480	19.5	SL04220-PP
240	360	160	1630	3300	370.0	440	56	SL045048-PP
240	320	95	740	1700	186.0	480	21	SL04240-PP
260	400	190	2380	4700	520.0	400	84.5	SL045052-PP
260	340	95	840	1990	215.0	440	22.5	SL04260-PP
280	420	190	2600	5200	570.0	380	90	SL045056-PP
300	460	218	3000	5800	620.0	340	126	SL045060-PP
300	380	95	900	2250	234.0	380	25.5	SL04300-PP

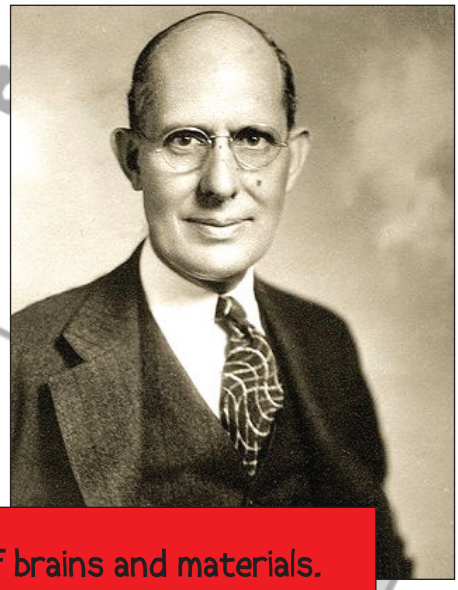
Cylindrical Roller Bearing

NU 52XX Series



Bore	OD	Width	Load Rating kN		Designation
d	D	W	Dynamic	Static	
20	47	20.638	33	34.5	NU 5204
25	52	20.638	38.5	43.5	NU 5205
30	62	23.9875	55.5	63	NU 5206
35	72	26.1625	87	79.5	NU 5207
40	80	30.1625	87	106	NU 5208
45	85	30.1625	64.5	122	NU 5209
50	90	30.1625	94	125	NU 5210
55	100	33.3375	114	155	NU 5211
60	110	36.5125	148	196	NU 5212
65	120	38.1	153	211	NU 5213
70	125	39.6875	170	235	NU 5214
75	130	41.275	191	178	NU 5215
80	140	44.45	207	294	NU 5216
85	150	49.2125	246	350	NU 5217
90	160	52.3875	290	420	NU 5218
95	170	55.5625	320	460	NU 5219
100	180	60.325	370	540	NU 5220
105	190	65.0875	480	580	NU 5221
110	200	69.85	420	620	NU 5222
120	215	76.2	570	905	NU 5224
130	230	79.375	515	775	NU 5226
140	250	82.55	700	900	NU 5228
150	270	88.9	825	1300	NU 5230





"Inventing is the mixing of brains and materials. The more brains you use, the less materials you need."

Charles F. Kettering

Taper
Roller Bearings

Taper Roller Bearing

Taper Roller Bearing

Taper roller bearings contain tapered inner and outer ring raceways, between there tapered roller are assembled. Projection lines of all tapered surface get connect at common point on axis of bearing.
Tapper roller bearings are suitable, where cobined radial and axial loads are acting.

Axial load carrying capacity of bearing depends on contact angle a, as angle increase, axial load carrying capacity also increase. Taper roller bearing are separable type i.e. cone (inner ring with roller and cage assembly) and cup (outer ring).
i) Single row taper roller bearings and also with seal on one side.
ii) Paired single row taper roller bearings. (double row and four row bearing)
iii) Also, inch size and metric size of bearings.

Series Available

302xx 303xx 313xx 329xx
320xx 322xx 331xx
323xx 330xx 332xx

ALSO IN COMPLETE INCH SERIES

H, HL, HM, T4CB, JM, JL, LM, HH and various.

For metric size steep angle and medium angle tapered roller bearings, the respective contact angle symbol is added After the bore number. For normal angle tapered roller bearings no contact angle symbol is used. Medium angle tapered roller

The cages of tapered roller bearing are usually steel cage

Permissible Mis alignment.

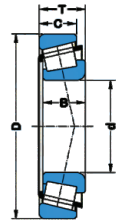
The permissible misalignment angle for tapered roller bearings is approximately 0.0009a radian (3')

Precautions for use of Taper Roller bearings.
if the load on tapered roller bearings become too small or the ratio of the radial & axial loads for matched bearings exceeds during during operation, slippage between the roller and race ways occurs, which may result in smearing especially in large bearings where the weight of roller and cage is high.

- At the time of adoption as he series. Please confirm the "abutment and filler dimensions",
- Bearings Feature : Both inner and outer ring and roller have Tapered surface whose apexes converge at a common point on the bearing axis.
Designed to support large radial and direction thrust load, well suited for heavy duty machinery subjected to impact loads.
Separable inner and outer rings simply mounting and dismounting.
Usually two bearings are arranged back to back or face to face on one shaft.They may also be used in pairs with clearance.

Taper Roller Bearing (Metric)

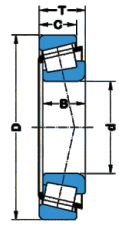
Single row
d15 - 40mm



Principal Dimension					Basic Load Rating		Speed Rating		Mass	Designation
d	D	T	B	C	Dynamic C	Static C_0	Reference Speed Grease	Limiting Speed Oil		
mm					kN		RPM		kg	
15	42	14.25	13	11	22.4	20	9100	12600	0.095	30302
17	40	13.25	12	11	19	18.6	9100	12600	0.075	30203
	47	15.25	14	12	28.1	25	8500	11200	0.13	30303
	47	20.25	19	16	40	33.5	8500	11200	0.17	32303
20	42	15	15	12	28	27	9100	11200	0.097	32004X
	47	15.25	14	12	32	28	8500	10500	0.12	30204
	52	16.25	15	13	39	32.5	8500	9800	0.17	30304
	52	22.25	21	18	51	45.5	8500	9800	0.23	32304
22	44	15	15	11.5	25.1	29	7700	10500	0.10	320/22X
25	47	15	15	11.5	31	32.5	8500	9800	0.11	32005X
	52	16.25	15	13	35.5	33.5	7700	9100	0.15	30205
	52	19.25	18	15	41.5	44	7000	9100	0.19	32205
	52	22	22	18	54	56	7000	9100	0.23	33205
	62	18.25	17	15	44.6	43	6300	8500	0.26	30305
	62	18.25	17	13	38	40	5300	7700	0.26	31305
	62	25.25	24	20	60.5	63	5600	8500	0.36	32305
28	52	16	16	12	36.5	38	7000	9100	0.15	320/28X
30	55	17	17	13	40.5	44	6300	7700	0.17	32006X
	62	17.25	16	14	46.5	44	6300	7700	0.23	30206
	62	21.25	20	17	58.5	57	6300	7700	0.28	32206
	72	20.75	19	16	58.8	47.6	5250	7000	0.38	30306
35	62	18	18	14	49	54	6000	7700	0.22	32007X
	72	18.25	17	15	58.5	56	5600	6700	0.32	30207
	72	24.25	23	19	76.5	78	5600	6700	0.43	32207
	72	28	28	22	96.5	106	5000	6700	0.56	33207
	80	22.75	21	18	83	73.5	5300	6300	0.52	30307
	80	22.75	21	15	71	67	4410	6000	0.52	31307
	80	32.75	31	25	95.2	106	4410	6000	0.73	32307
38	63	17	17	13.5	42.5	52	6000	7700	0.20	JL69349A/310
	63	17	17	13.5	42.5	52	6000	7700	0.20	JL69349X/310
	68	19	19	14.5	60	71	5300	7000	0.27	32008/38X
40	68	19	19	14.5	60	71	5300	6300	0.27	32008X
	75	26	26	20.5	91.5	104	5000	6300	0.51	33108
	80	19.75	18	16	71	68	5000	6000	0.42	30208
	80	24.75	23	19	85	86.5	5000	6000	0.53	32208
	80	32	32	25	120	132	4410	6000	0.77	33208

Taper Roller Bearing (Metric)

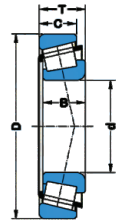
Single row
d40 - 55mm



Principal Dimension					Basic Load Rating		Speed Rating		Mass	Designation
d	D	T	B	C	Dynamic C	Static C_0	Reference Speed Grease	Limiting Speed Oil		
mm					kN		RPM		kg	
40	85	33	32.5	28	121	150	4200	6300	0.90	T2EE040
	90	25.25	23	20	100	95	4410	5600	0.72	30308
	90	25.25	23	17	85	81.5	3800	5300	0.72	31308
	90	35.25	33	27	117	140	3800	5300	1.00	32308
45	75	20	20	15.5	67	80	5000	6000	0.34	32009X
	80	26	26	20.5	96.5	114	4700	5600	0.56	33109
	85	20.75	19	16	76.5	76.5	4500	5600	0.48	30209
	85	24.75	23	19	91.5	98	4500	5600	0.58	32209
	85	32	32	25	108	143	3800	5300	0.82	33209
	95	29	26.5	20	104	112	3800	5000	0.92	T7FC 045
	95	36	35	30	106	146	3800	5000	1.20	T2ED 045
	100	27.25	25	22	125	120	3950	5000	0.97	30309
	100	27.25	25	18	106	102	3500	4700	0.95	31309
	100	38.25	36	30	140	170	3500	4700	1.35	32309
46	75	18	18	14	58.5	71	5000	6700	0.30	LM 503349/310
50	80	20	20	15.5	69.5	88	4500	5600	0.37	32010X
	80	24	24	19	80	102	4500	5600	0.45	33010
	82	21.5	21.5	17	83	100	4500	6000	0.43	JLM 104948
	85	26	26	20	100	122	4200	5300	0.59	33110
	90	21.75	20	17	86.5	91.5	4200	5300	0.54	30210
	90	24.75	23	19	95	100	4200	5300	0.61	32210
	90	28	28	23	122	140	4200	5600	0.75	JM 2015149/110
	90	32	32	24.5	114	160	3500	5300	0.90	33210
	100	36	35	30	154	200	3500	5300	1.30	T2ED 050
	105	32	29	22	125	137	3400	4500	1.20	T7FC 050
	110	29.25	27	23	143	144	3750	4500	1.25	30310
	110	29.25	27	19	122	120	3200	4200	1.30	31310
	110	42.25	40	33	172	212	3200	4200	1.80	32310
55	90	23	23	17.5	93	116	3950	5000	0.55	32011
	90	27	27	21	104	137	3950	5000	0.67	33011
	95	30	30	23	110	156	3500	4700	0.86	33111
	100	22.75	21	18	104	106	3750	4700	0.70	30211
	100	26.75	25	21	106	129	3500	4700	0.83	32211
	100	35	35	27	138	190	3200	4500	1.20	33211
	110	39	39	32	179	232	3200	4700	1.70	T2ED 055
	115	34	31	23.5	146	163	3050	4000	1.60	T7FC 055

Taper Roller Bearing (Metric)

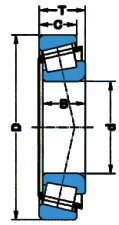
Single row
d55 - 70mm



Principal Dimension					Basic Load Rating		Speed Rating		Mass	Designation
d	D	T	B	C	Dynamic C	Static C_0	Reference Speed Grease	Limiting Speed Oil		
mm					kN		RPM		kg	
55	120	31.5	29	25	166	163	4500	5600	1.65	30311
	120	31.5	29	21	140	137	3050	4000	1.55	31311
	120	45.5	43	35	198	250	2800	3950	2.30	32311
60	95	23	23	17.5	95	122	3750	4700	0.59	32012X
	95	24	24	19	96.5	132	3750	5000	0.63	JLM 508748/710
	95	27	27	21	106	143	3750	4700	0.71	33012
	100	30	30	23	134	170	3750	4450	0.92	33112
	110	23.75	22	19	112	114	3500	4200	0.88	30212
	110	29.75	28	24	146	160	3500	4200	1.15	32212
	110	38	38	29	168	236	2800	4200	1.60	33212
	115	40	39	33	194	260	3050	4450	1.85	T2EE 060
	125	37	33.5	26	176	204	2800	3750	2.05	T7FC060
	130	33.5	31	26	168	196	2800	3750	1.95	30312
	130	33.5	31	22	166	166	2700	3750	1.90	31312
	130	48.5	46	37	229	290	2330	3750	2.85	32312
65	100	23	23	17.5	96.5	127	3300	4200	0.63	32013X
	100	27	27	21	110	153	3500	4500	0.78	33013
	110	28	28	22.5	143	283	3400	4500	1.05	JM 511946/910
	110	31	31	25	138	193	3050	4500	1.15	T2DD 065
	110	34	34	26.5	142	208	3050	4000	1.30	33113
	120	24.75	23	20	132	134	3200	4000	1.15	30213
	120	32.75	31	27	158	218	2800	4000	1.50	32213
	120	41	41	32	194	270	2700	3750	2.05	33213
	130	37	33.5	26	180	216	2700	3500	2.20	T7FC 065
	140	36	33	28	194	228	2500	3400	2.40	30313
	140	36	33	23	190	193	2500	3400	2.35	31313
	140	51	48	39	264	335	2400	3400	3.45	32313
70	110	25	25	19	116	153	3200	3950	0.84	32014 X
	110	31	31	25.5	130	196	3050	3400	1.10	33014
	120	37	37	29	172	250	2800	3750	1.70	33114
	125	26.25	24	21	125	156	2800	3750	1.25	30214
	125	33.25	31	27	157	208	2700	3750	1.60	32214
	125	41	41	32	201	285	2550	3500	2.10	33214
	130	43	42	35	233	325	2700	4000	2.45	T2ED 070
	140	39	35.5	27	204	240	2400	3200	2.65	T7FC 070
	150	38	35	30	220	260	2400	3200	2.90	30314

Taper Roller Bearing (Metric)

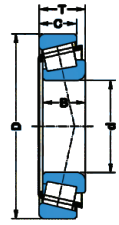
Single row
d70 - 90mm



Principal Dimension					Basic Load Rating		Speed Rating		Mass	Designation
d	D	T	B	C	Dynamic C	Static C_0	Reference Speed Grease	Limiting Speed Oil		
mm					kN		RPM		kg	
70	150	38	35	25	216	220	2400	3200	2.95	31314
	150	54	51	42	297	380	2300	3200	4.30	32314
75	105	20	20	16	81.5	116	3400	4450	0.52	32915
	115	25	25	19	122	163	3100	3750	0.90	32015
	115	31	31	25.5	134	228	2800	3750	1.15	33015
	120	31	29.5	25	160	216	3050	3400	1.30	JM714249/210
	125	37	37	29	176	265	2700	3600	1.80	33115
	130	27.25	25	22	140	176	2700	3500	1.40	30215
	130	33.25	31	27	161	212	2600	3500	1.70	32215
	130	41	41	31	209	300	2400	3400	2.25	33215
	150	42	38	29	232	280	2250	3050	3.25	T7FC 075
	160	40	37	31	246	290	2250	3050	3.45	30315
	160	40	37	26	240	245	2250	3050	3.50	31315
	160	58	55	45	336	440	2150	2800	5.20	32315
80	125	29	29	22	138	216	2550	3500	1.30	32016X
	125	36	36	29.5	168	285	2550	3500	1.65	33016
	130	35	38	31.5	176	275	2550	3750	1.70	JM 515649/610
	130	37	37	29	179	280	2550	3400	1.90	33116
	140	28.25	26	22	151	183	2400	3400	1.60	30216
	140	35.25	33	28	187	245	2400	3200	2.05	32216
	140	46	46	35	251	375	2250	3200	2.90	33216
	160	45	41	31	260	315	2100	2800	3.95	T7FC 080
	170	42.5	39	33	270	320	2100	3050	4.10	30316
	170	42.5	39	27	260	265	2100	2800	4.05	31316
	170	61.5	58	48	380	500	2100	3050	6.20	32316
85	130	29	29	22	140	224	2400	3400	1.35	32017
	130	36	36	29.5	183	310	2550	3400	1.75	33017
	140	41	41	32	220	340	2400	3200	2.45	33117
	150	30.5	28	24	176	220	2250	3050	2.05	30217
	150	38.5	36	30	212	285	2250	3050	2.60	32217
	150	49	49	37	286	430	2100	3050	3.70	33217
	180	44.5	41	34	303	365	2000	2800	4.85	30317
	180	44.5	41	28	242	285	1850	2700	4.60	31317
	180	63.5	60	49	402	530	2000	2800	6.85	32317
90	140	32	32	24	168	270	2250	3050	1.75	32018
	140	39	39	32.5	216	355	2250	3200	2.20	33018

Taper Roller Bearing (Metric)

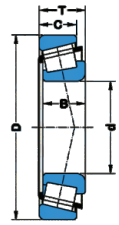
Single row
d90 - 110mm



Principal Dimension					Basic Load Rating		Speed Rating		Mass	Designation
d	D	T	B	C	Dynamic C	Static C_0	Reference Speed Grease	Limiting Speed Oil		
mm					kN		RPM		kg	
90	145	35	34	27	201	305	2250	3400	2.10	JM 718149 A/110
	150	45	45	35	251	390	2100	3050	3.10	33118
	150	45	45	35	251	390	2100	3050	3.10	33118
	160	32.5	30	26	194	245	2100	2800	2.55	30218
	160	42.5	40	34	251	340	2100	3000	3.35	32218
	190	46.5	43	36	330	400	1850	2800	5.65	30318
	190	46.5	43	30	264	315	1700	2500	5.90	31318
	190	67.5	64	53	457	610	1850	2800	8.40	32318
95	145	32	32	24	168	270	2250	3050	1.80	32019
	145	39	39	32.5	220	375	2250	3050	2.30	33019
	170	34.5	32	27	216	275	2000	2700	3.00	30219
	170	45.5	43	37	281	390	2000	2700	4.05	32219
	170	58	58	44	374	560	1850	2700	5.50	33219
	200	49.5	45	38	330	390	1850	2400	6.70	30319
	200	49.5	45	32	292	355	1700	2400	6.95	31319
	200	71.5	67	55	501	670	1700	2400	1.10	32319
100	140	25	25	20	119	204	2250	3400	1.15	32920
	145	24	22.5	17.5	125	190	2250	3200	1.15	T4CB 100
	150	32	32	24	172	280	2100	2800	1.90	32020X
	150	39	39	32.5	224	390	2100	2800	2.40	33020
	157	42	42	34	246	400	2100	3050	2.90	HM 220149/110
	165	47	46	39	314	480	2000	3050	3.90	JHM720249/210
	165	47	46	39	314	480	2000	3050	3.90	T2EE 100
	180	37	34	29	246	320	2000	2550	3.65	30220
	180	49	46	39	319	440	1850	2550	4.90	32220
	180	63	63	48	429	655	1700	2550	6.95	33220
	215	51.5	47	39	402	490	1700	2250	8.05	30320
	215	56.5	51	35	430	465	1700	2100	8.60	31320
	215	77.5	73	60	572	780	1550	2100	1.25	32320
105	160	35	35	26	201	335	2000	2700	2.40	32021X
	160	43	43	34	246	430	2000	2700	3.05	33021
	190	39	36	30	270	355	1850	2400	4.25	30221
	190	53	50	43	358	510	1850	2400	6.00	32221
	225	81.5	77	63	605	815	1400	2100	14.5	32321
110	150	25	25	20	125	224	2100	3050	1.25	32922
	170	38	38	29	233	390	1850	2550	3.05	32022X

Taper Roller Bearing (Metric)

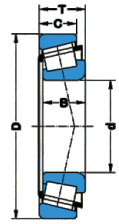
Single row
d110 - 160mm



Principal Dimension					Basic Load Rating		Speed Rating		Mass	Designation
d	D	T	B	C	Dynamic C	Static C_0	Reference Speed Grease	Limiting Speed Oil		
mm					kN		RPM		kg	
110	170	47	47	37	281	500	1850	2550	3.85	33022
	180	56	56	43	369	630	1850	2400	5.55	33122
	200	41	38	32	308	405	1700	2250	5.10	30222
	200	56	53	46	402	570	1700	2250	7.10	32222
	240	54.5	50	42	473	585	1550	2000	11.0	30322
	240	63	57	38	457	585	1350	2000	12.2	31322X
	240	84.5	80	65	627	830	1350	2000	17.0	32322
120	165	29	29	23	165	305	1850	2700	1.60	32924
	170	27	25	19.5	157	250	1850	2700	1.70	T4CB 120
	180	38	38	29	242	415	1700	2400	3.25	32024X
	180	48	48	38	292	540	1850	2400	4.20	33024
	215	43.5	40	34	341	465	1550	2100	6.15	30224
	215	61.5	58	50	468	695	1550	2100	9.15	32224
	260	59.5	55	46	561	710	1400	1850	1.40	30324
	260	68	62	42	539	695	1200	1700	1.55	31324
	260	90.5	86	69	792	1120	1300	1850	21.5	32324
130	180	32	32	25	198	365	1700	2550	2.40	32926
	200	45	45	34	314	540	1550	2100	4.95	32026X
	230	43.75	40	34	369	490	1400	2000	7.60	30226
	230	67.75	64	54	550	830	1400	2000	1.15	32226
	280	63.75	58	49	627	800	1300	1700	1.70	30326
	280	72	66	44	605	780	1150	1700	1.85	31326X
140	190	32	32	25	205	390	1600	2400	2.55	32928
	195	29	27	21	194	325	1600	2250	2.40	T4CB 140
	210	45	45	34	330	585	1600	2000	5.25	32028X
	250	45.75	42	36	418	570	1350	1850	8.65	30228
	250	71.75	68	58	644	1000	1350	1850	1.45	32228
	300	77	70	47	693	900	1050	1550	2.45	31328X
150	225	48	48	36	369	655	1400	1850	6.35	32030X
	225	59	59	46	457	865	1400	1850	8.15	33030
	270	49	45	38	429	560	1300	1700	1.10	30230
	270	77	73	60	737	1140	1200	1700	17.5	32230
	320	82	75	50	781	1020	1000	1400	29.5	31330X
160	240	51	51	38	429	780	1300	1700	7.75	32032X
	290	52	48	40	528	735	1150	1600	1.30	30232
	290	84	80	67	880	1400	1150	1600	2.55	32232

Taper Roller Bearing (Metric)

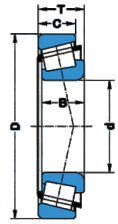
Single row
d160 - 300mm



Principal Dimension					Basic Load Rating		Speed Rating		Mass	Designation
d	D	T	B	C	Dynamic C	Static C_0	Reference Speed Grease	Limiting Speed Oil		
mm					kN		RPM		kg	
160	340	75	68	58	913	1180	1050	1400	2.90	30332
170	230	32	30	23	251	440	1350	2000	3.45	T4DB 170
	230	38	38	30	286	585	1350	2000	4.50	32934
	260	57	57	43	512	915	1200	1550	10.5	32034X
	310	57	52	43	616	865	1050	1400	19.0	30234
180	240	32	30	23	251	450	1300	1850	3.6	T4DB 180
	250	45	45	34	352	735	1200	1850	6.65	32936
	280	64	64	48	644	1160	1150	1600	14.5	32036X
	320	57	52	43	583	815	1050	1400	20.0	30236
	320	91	86	71	1010	1630	1000	1350	29.5	32236
190	260	45	45	34	358	765	1150	1700	7.0	32938
	260	46	44	36.5	380	800	1150	1700	6.7	JM 738249/210
	290	64	64	48	660	1200	1050	1400	15.0	32038X
	340	60	55	46	721	1000	1000	1300	24.0	30238
200	270	37	34	27	330	600	1150	1700	5.45	T4DB 200
	280	51	51	39	473	950	1050	1550	9.5	32940
	310	70	70	53	748	1370	1000	1350	19.5	32040X
	360	64	58	48	792	1120	950	1200	25.0	30240
	360	104	98	82	1210	2000	950	1200	42.5	32240
220	285	41	40	33	396	830	1050	1550	6.45	T2DC 220
	300	51	51	39	484	1000	1000	1400	10.0	32944
	340	76	76	57	897	1660	950	1200	25.5	32044X
	400	72	65	54	990	1400	850	1150	40.0	30244
	400	114	108	90	1610	2700	800	1050	60.0	32244
240	320	42	39	30	429	815	950	1350	84.5	T4EB 240
	320	51	51	39	512	1080	950	1350	11.0	32948
	360	76	76	57	935	1800	850	1150	27.5	32048X
	440	127	120	100	1790	3350	700	1000	83.5	32248
260	400	87	87	65	1170	2200	800	1000	40.0	32052X
	480	137	130	106	2200	3650	650	850	105	32252
	540	113	102	85	2120	3050	600	850	110	30352
280	380	63.5	63.5	48	765	1660	800	1150	20.0	32956
	420	87	87	65	1210	2360	700	950	40.5	32056X
300	420	76	76	57	1050	2240	700	1000	32.0	32960
	460	100	100	74	1540	3000	650	850	58.0	32060X
	540	149	140	115	2750	4750	600	800	140	32260

Taper Roller Bearing (Metric)

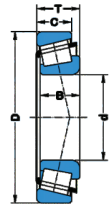
Single row
d320 - 360mm



Principal Dimension					Basic Load Rating		Speed Rating		Mass	Designation
d	D	T	B	C	Dynamic C	Static C_0	Reference Speed Grease	Limiting Speed Oil		
mm					kN		RPM		kg	
320	440	76	76	57	1080	2360	650	950	33.5	32964
	480	100	100	74	1540	3100	600	800	64.0	32064X
340	460	76	76	57	1080	2400	600	950	35.0	32968
360	480	76	76	57	1120	2550	600	850	37.0	32972

Taper Roller Bearing(Inch)

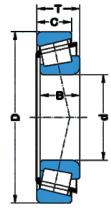
d12.700 - 25.159mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
12.700	34.988	10.998	10.988	8.730	12.3	11.6	12000	16000	0.053	A4050/A4138
14.989	34.988	10.998	10.988	8.730	12.3	11.6	12000	16000	0.049	A4059/A4138
15.875	41.275	14.288	14.681	11.112	20.3	18.7	10000	13000	0.092	03062/03162
	42.862	14.288	14.288	9.525	17.6	17.5	8700	12000	0.103	11590/11520
	42.862	16.670	16.670	13.495	26.7	26.0	9800	13000	0.122	17580/17520
	47.000	14.381	14.381	11.112	24.0	24.2	8600	11000	0.131	05062/05185
	49.225	19.845	21.539	14.288	38.5	39.0	8500	11000	0.203	09062/09195
16.993	47.000	14.381	14.381	11.112	24.0	24.2	8600	11000	0.127	05066/05185
17.462	39.878	13.843	14.605	10.668	23.8	24.2	10000	13000	0.084	LM11749/LM11710
19.050	39.992	12.014	11.153	9.525	12.8	12.8	10000	13000	0.065	A6075/A6157
	45.237	15.494	16.637	12.065	28.3	28.6	8900	12000	0.122	LM11949/LM11910
	47.000	14.381	14.381	11.112	24.0	24.2	8600	11000	0.121	05075/05185
	49.225	18.034	19.050	14.288	38.5	39.0	8500	11000	0.179	09067/09195
	49.225	19.845	21.539	14.288	38.5	39.0	8500	11000	0.188	09078/09195
	49.225	21.209	19.050	17.462	38.5	39.0	8500	11000	0.198	09067/09196
	53.975	22.225	21.839	15.875	40.0	39.0	8000	11000	0.248	21075/21212
	56.896	19.368	19.837	15.875	42.5	46.5	7200	9600	0.272	1775/1729
19.987	47.000	14.381	14.381	11.112	24.0	24.2	8600	11000	0.177	05079/05185
20.000	50.005	13.495	14.260	9.525	26.0	27.9	7500	10000	0.138	07079/07196
20.625	49.225	19.845	21.539	14.288	38.5	39.0	8500	11000	0.179	09081/09195
20.638	49.225	19.845	19.845	15.875	37.5	39.0	8200	11000	0.182	12580/12520
21.430	50.005	17.526	18.288	13.970	38.0	39.0	8000	11000	0.169	M12649/M12610
21.986	45.974	15.494	16.637	12.065	29.6	34.0	8400	11000	0.123	LM12749/LM12711
22.225	50.005	13.495	14..260	9.525	26.0	27.9	7500	10000	0.13	07087/07196
	50.005	17.526	18.288	13.970	38.0	39.0	8000	11000	0.165	M12648/M12610
	52.388	19.368	20.168	14.288	40.5	43.0	7600	10000	0.2	1380/1328
	53.975	19.368	20.168	14.288	40.5	43.0	7600	10000	0.215	1380/1329
	58.896	19.368	19.837	15.875	42.5	46.5	7200	9600	0.256	1755/1729
	57.150	22.225	22.225	17.462	47.0	49.5	7100	9500	0.286	1280/1220
22.606	47.000	15.500	15.500	12.000	27.5	32.5	8200	11000	0.125	LM72849/LM72810
23.812	50.005	13.495	14.260	9.525	26.0	27.9	7500	10000	0.123	07093/07196
	50.292	14.224	17.732	10.668	28.8	34.0	7400	9900	0.137	L44640/L44610
	56.896	19.368	19.837	15.875	42.5	46.5	7200	9600	0.247	1779/1729
24.981	50.005	13.495	14.260	9.525	26.0	27.9	7500	10000	0.118	07098/07196
25.000	50.005	13.495	14.260	9.525	26.0	27.9	7500	10000	0.118	07097/07196
25.159	50.005	13.495	14.260	9.525	26.0	27.9	7500	10000	0.117	07096/07196

Taper Roller Bearing(Inch)

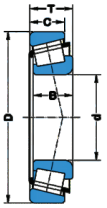
d25.400 - 30.000mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
25.400	50.005	13.495	14.260	9.525	26.0	27.9	7500	10000	0.117	07100/07196
	50.005	13.495	14.260	9.525	26.0	27.9	7500	10000	0.166	07100S/07196
	50.292	14.224	14.732	10.668	28.8	34.0	7400	9900	0.13	L44643/L/44610
	51.994	15.011	14.260	12.700	26.0	27.9	7500	10000	0.144	07100/07204
	56.896	19.368	19.837	15.875	42.5	46.5	7200	9600	0.238	1780/1729
	57.150	19.431	19.431	14.732	42.0	48.5	6900	9200	0.241	M84548/M84510
	61.912	19.050	20.638	14.288	46.5	54.0	6100	8200	0.3	15101/15243
	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.299	15101/15245
	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.301	15102/15245
	64.292	21.433	21.433	16.670	51.5	64.5	6100	8100	0.371	M86643/M86610
	65.088	22.225	21.463	15.875	47.0	50.5	5700	7600	0.36	23100/23256
	66.421	23.812	25.433	19.050	64.5	72.5	6200	8200	0.442	2687/2631
26.157	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.296	15103/15245
26.162	66.421	23.812	25.433	19.050	64.5	72.5	6200	8200	0.436	2682/2631
26.988	50.292	14.224	14.732	10.668	28.8	34.0	7400	9900	0.12	L44649/L44610
	60.325	19.842	17.462	15.875	39.5	45.5	6700	8900	0.26	15580/15523
	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.291	15106/15245
	66.421	23.812	25.433	19.050	64.5	72.5	6200	8200	0.429	2688/2631
28.575	56.896	19.845	19.355	15.875	40.5	44.5	6700	8900	0.217	1985/1930
	57.150	17.462	17.462	13.495	39.5	45.5	6700	8900	0.196	15590/15520
	58.738	19.050	19.355	15.080	40.5	44.5	6700	8900	0.23	1985/1932
	60.325	19.842	17.462	15.875	39.5	45.5	6700	8900	0.25	15590/15523
	60.325	19.845	19.355	15.875	40.5	44.5	6700	8900	0.255	1985/1931
	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.277	15112/15245
	64.292	21.433	21.433	16.670	51.5	64.5	6100	8100	0.348	M86647/M86610
	66.421	23.812	25.433	19.050	64.5	72.5	6200	8200	0.416	2689/2631
	68.262	22.225	22.225	17.462	57.0	67.0	5800	7700	0.409	02474/02420
	68.262	22.225	23.812	17.462	57.5	65.5	5700	7700	0.41	2474/2420
	69.850	23.812	25.357	19.050	69.0	81.5	5700	7600	0.483	2578/2523
	72.626	24.608	24.257	17.462	58.0	55.5	5800	7700	0.477	41125/41286
	73.025	22.225	22.225	17.462	56.5	68.0	5300	7000	0.48	02872/02820
29.000	50.292	14.224	14.732	10.668	28.0	35.5	7200	9600	0.113	L45449/L45410
29.367	66.421	23.812	25.433	19.050	64.5	72.5	6200	8200	0.406	2690/2631
	62.000	16.002	16.566	14.288	39.0	42.0	6300	8400	0.228	17118/17244
29.987	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.269	15117/15245
30.000	69.012	19.845	19.583	15.875	48.5	58.0	5600	7400	0.369	14117A/14276
	72.000	29.370	27.783	23.020	72.0	97.0	5400	7100	0.619	JHM88540/JHM88513

Taper Roller Bearing(Inch)

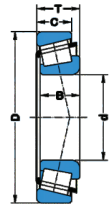
d30.112 - 33.338mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
30.112	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.268	15116/15245
30.162	62.000	16.002	16.566	14.288	39.0	42.0	6300	8400	0.226	17119/17244
	64.292	21.433	21.433	16.670	51.5	64.5	6100	8100	0.336	M86649/M86610
	69.850	23.812	25.357	19.050	69.0	81.5	5700	7600	0.468	2558/2523
	72.626	30.162	29.997	23.812	84.5	98.0	5500	7300	0.621	3187/3120
30.213	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.265	15118/15245
	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.267	15119/15245
	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.267	15120/15245
30.226	69.012	19.845	19.583	15.875	48.5	58.0	5600	7400	0.366	14116/14274
	69.012	19.845	19.583	15.875	48.5	58.0	5600	7400	0.37	14116/14276
31.750	59.131	15.875	16.764	11.811	34.5	41.0	6300	8400	0.182	LM67048/LM67010
	62.000	18.161	19.050	14.288	46.5	54.0	6100	8200	0.244	15123/15245
	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.253	15125/15245
	62.000	19.050	20.638	14.288	46.5	54.0	6100	8200	0.255	15126/15245
	66.421	25.400	25.357	20.638	69.0	81.5	5700	7600	0.409	2580/2520
	68.262	22.225	22.225	17.462	57.0	67.0	5800	7700	0.38	02475/02420
	68.262	22.225	22.225	17.462	57.0	67.0	5800	7700	0.383	02476/02420
	69.012	19.845	19.583	15.875	48.5	58.0	5600	7400	0.359	14124/14276
	69.012	19.845	19.583	15.875	48.5	58.0	5600	7400	0.356	14125A/14276
	69.850	23.812	25.357	19.050	69.0	81.5	5700	7600	0.454	2580/2523
	69.850	23.812	25.357	19.050	69.0	81.5	5700	7600	0.451	4T/2582/2523
	72.626	30.162	29.997	23.812	84.5	98.0	5500	7300	0.603	3188/3120
	72.626	30.162	29.997	23.812	84.5	98.0	5500	7300	0.601	3193/3120
	73.025	22.225	22.225	17.462	56.5	68.0	5300	7000	0.451	02875/02820
	73.025	22.225	23.812	17.462	62.5	75.5	5200	7000	0.465	2879/2820
	73.025	29.370	27.783	23.020	72.0	97.0	5400	7100	0.622	HM88542/HM88510
	73.812	29.370	27.783	23.020	72.0	97.0	5400	7100	0.638	HM88542/HM88512
	76.200	29.370	28.575	23.020	78.0	105	5100	6800	0.686	HM89440/HM89410
	79.375	29.370	29.771	23.812	93.0	114	4900	6600	0.767	3476/3420
33.338	68.262	22.225	22.225	17.462	56.5	71.0	5700	7500	0.378	M88048/M88010
	69.012	19.845	19.583	15.875	48.5	58.0	5600	7400	0.344	14131/14276
	69.850	23.812	25.357	19.050	69.0	81.5	5700	7600	0.435	2585/2523
	72.626	30.162	29.997	23.812	84.5	98.0	5500	7300	0.581	3196/3120
	73.025	29.370	27.783	23.020	72.0	97.0	5400	7100	0.604	HM88547/HM88510
	76.200	23.812	25.654	19.050	73.0	90.5	5100	6800	0.551	2785/2720
	76.200	29.370	28.575	23.020	78.0	105	5100	6800	0.668	HM89443/HM89410

Taper Roller Bearing(Inch)

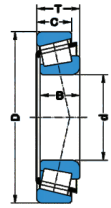
d33.338 - 36.512mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
33.338	76.200	29.370	28.575	23.020	78.0	105	5100	6800	0.665	HM89444/HM89410
	79.375	25.400	24.074	17.462	65.5	67.0	5200	6900	0.568	43131/43312
34.925	65.088	18.034	18.288	13.970	46.5	56.0	5700	7600	0.249	LM48548/LM48510
	65.088	18.034	18.288	13.970	46.5	56.0	5700	7600	0.252	LM48548A/LM48510
	69.012	19.845	19.583	15.875	48.5	58.0	5600	7400	0.333	14137A/14276
	72.233	25.400	25.400	19.842	65.0	84.5	5400	7200	0.489	HM88649/HM88610
	72.238	20.638	20.638	15.875	48.0	58.5	5300	7000	0.385	16137/16284
	73.025	22.225	22.225	17.462	56.5	68.0	5300	7000	0.422	02877/02820
	73.025	22.225	22.225	17.462	56.5	68.0	5300	7000	0.425	02878/02820
	73.025	22.225	23.812	17.462	62.5	75.5	5200	7000	0.434	2878/2820
	73.025	23.812	24.608	19.050	71.0	85.0	5300	7100	0.471	25877/25820
	73.025	23.812	24.608	19.050	71.0	85.0	5300	7100	0.474	25877/25821
	73.025	23.812	25.654	19.050	73.0	90.5	5100	6800	0.485	2793/2735X
	76.200	23.812	25.654	19.050	73.0	90.5	5100	6800	0.536	2793/2720
	76.200	23.812	25.654	19.050	73.0	90.5	5100	6800	0.541	2793/2729
	76.200	29.370	28.574	23.020	78.0	105.0	5100	6800	0.464	HM89446/HM89410
	76.200	29.370	28.575	23.812	80.5	97.0	5100	6800	0.625	31593/31520
	76.200	29.370	28.575	23.812	80.5	97.0	5100	6800	0.627	31594/31520
	79.375	29.370	29.771	23.812	93.0	114.0	4900	6600	0.725	3478/3420
	80.167	29.370	30.391	23.812	95.0	112.0	4800	6400	0.732	3379/3320
	85.725	30.162	30.162	23.812	105.0	132.0	4500	6000	0.897	3872/3820
34.976	69.012	19.845	19.583	15.875	48.5	58.0	5600	7400	0.333	14139/14276
34.988	59.974	15.875	16.764	11.938	35.5	47.5	6100	8100	0.179	L68149/L68111
	61.973	16.700	17.000	13.600	37.0	48.0	5900	7900	0.209	LM78349A/LM78310A
	61.973	18.000	17.000	15.000	37.0	48.0	5900	7900	0.218	LM78349/LM78310C
35.000	70.000	24.00	23.500	19.000	62.0	78.0	5500	7300	0.42	JS0549AJS5310
	79.375	23.812	25.400	19.050	76.5	97.5	4800	6400	0.61	26883/26822
	88.000	21.000	22.403	17.826	68.0	75.0	4700	6300	0.534	339/332
35.717	72.233	25.400	25.400	19.842	65.0	84.5	5400	7200	0.478	HM88648/HM88610
	72.626	25.400	25.400	19.842	65.0	84.5	5400	7200	0.482	HM88648/HM88611AS
36.487	73.025	23.812	24.608	19.050	71.0	85.0	5300	7100	0.457	25880/25820
	76.200	23.812	25.654	19.050	73.0	90.5	5100	6800	0.518	2780/2720
36.512	76.200	29.370	28.575	23.020	78.0	105.0	5100	6800	0.629	HM89448/HM89410
	76.200	29.370	28.575	23.020	78.0	105.0	5100	6800	0.631	HM89449/HM89410
	76.200	29.370	28.575	23.812	80.5	97.0	5100	6800	0.605	31597/31520
	79.375	29.370	28.829	22.664	86.5	104.0	5000	6600	0.686	HM89249/HM89210

Taper Roller Bearing(Inch)

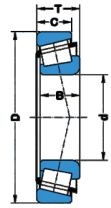
d36.512 - 41.275mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
36.512	79.375	29.370	29.771	23.812	93.0	114.0	4900	6600	0.707	3490/3420
	88.500	25.400	23.698	17.462	70.5	78.0	4000	5300	0.729	44143/44348
38.000	63.00	17.00	17.000	13.500	38.5	52.5	5700	7600		JL69349/JL69310
38.100	63.500	12.700	11.908	9.525	25.9	33.5	5500	7300	0.147	13889/13830
	65.088	18.034	18.288	13.970	43.5	57.0	5500	7400	0.233	LM29748/LM29710
	69.012	19.050	19.050	15.083	47.5	59.5	5300	7100	0.293	13685/13621
	69.012	19.050	19.050	15.083	47.5	59.5	5300	7100	0.296	13687/13621
	73.438	15.875	16.520	11.908	43.5	51.0	5400	7200	0.273	19150/19281
	72.000	19.000	20.638	14.237	48.0	58.5	5300	7000	0.331	16150/16282
	76.200	20.638	20.940	15.507	55.5	63.0	5000	6700	0.405	28150/28300
	76.200	23.812	25.654	19.050	73.0	90.5	5100	6800	0.495	2776/2720
	76.200	23.812	25.654	19.050	73.0	90.5	5100	6800	0.497	2788/2720
	79.375	23.812	25.400	19.050	76.5	97.5	4800	6400	0.574	26878/26822
	79.375	29.370	29.771	23.812	93.0	114	4900	6600	0.683	3490/3420
	80.000	21.006	20.940	15.875	55.5	63.0	5000	6700	0.467	28150/28315
	80.035	24.608	23.698	18.512	67.0	82.5	4800	6400	0.562	27880/27820
	82.550	29.370	28.575	23.020	87.0	117	4700	6200	0.767	HM801346/HM801310
	82.931	23.812	25.400	19.050	76.0	98.0	4500	6000	0.645	25572/25520
	85.725	30.162	30.162	23.812	105	132	4500	6000	0.857	3875/3820
	87.312	30.162	30.886	23.812	94.0	117	4400	5900	0.881	3580/3525
	88.500	25.400	23.698	17.462	70.5	78.0	4000	5300	0.711	44150/44348
	88.500	26.988	29.083	22.225	95.5	107	4600	6100	0.840	418/414
39.688	76.200	23.812	25.654	19.050	73.0	90.5	5100	6800	0.477	2789/2720
	77.534	29.370	30.391	23.812	95.0	112	4800	6400	0.669	3382/3321
	79.375	23.812	25.400	19.050	76.5	97.5	4800	6400	0.554	26880/26822
	80.035	29.370	30.391	23.812	95.0	112	4800	6400	0.666	3382/3339
	80.167	29.370	30.391	23.812	95.0	112	4800	6400	0.668	3386/3320
	88.500	25.400	23.698	17.462	70.0	78.0	4000	5300	0.691	44158/44348
40.000	76.200	20.638	20.940	15.507	55.5	63.0	5000	6700	0.386	28158/28300
	80.000	21.000	22.403	17.826	68.0	75.0	4700	6300	0.479	344/332
	85.000	20.638	21.692	17.462	69.5	79.5	4400	5800	0.562	350A/354A
	88.500	26.988	29.083	22.225	95.5	107	4600	6100	0.813	420/414
	107.950	36.512	36.957	28.575	141	177	3600	4800	1.770	543/532
40.483	82.550	29.370	28.575	23.020	87.0	117	4700	6200	0.731	HM801349/HM801310
40.988	67.975	17.500	18.000	13.500	46.0	62.5	5300	7000	0.239	LM300849/LM300811
41.275	73.025	16.667	17.462	12.700	46.0	55.5	5000	6600	0.281	18590/18520

Taper Roller Bearing(Inch)

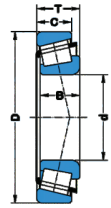
d41.275 - 44.450mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
41.275	73.431	19.558	19.812	14.732	56.0	69.5	5000	6600	0.335	LM501349/LM501310
	73.431	21.430	19.812	16.604	56.0	69.5	5000	6600	0.355	LM501349/LM501314
	76.200	18.009	17.384	14.288	42.5	51.5	4900	6500	0.337	11162/11300
	76.200	22.225	23.020	17.462	65.0	80.5	4900	6500	0.432	24780/24720
	76.200	25.400	25.400	20.638	76.5	97.5	4800	6400	0.488	26882/26823
	79.375	23.812	25.400	19.050	76.5	97.5	4800	6400	0.535	26885/26822
	80.000	18.009	17.384	14.288	42.5	51.5	4900	6500	0.389	11162/11315
	80.000	21.000	22.403	17.826	68.0	75.0	4700	6300	0.468	336/332
	80.000	23.812	25.400	19.050	76.5	97.5	4800	6400	0.542	26882/26824
	82.550	26.543	25.654	20.193	80.5	104	4600	6100	0.642	M802048/M802011
	85.725	30.162	30.162	23.812	105	132	4500	6000	0.81	3880/3820
	87.312	30.162	30.886	23.812	94.0	117	4400	5900	0.834	3576/3525
	88.900	30.162	29.370	23.02	93.5	125	4300	5800	0.901	HM803145/HM803110
	90.488	39.688	40.386	33.338	136	175	4300	5800	1.25	4388/4335
	92.075	26.195	23.812	16.67	72.5	81.5	3800	5000	0.758	M903345/M903310
	93.662	31.75	31.750	26.195	104	131	4100	5500	1.09	46162/46368
	95.250	30.162	29.370	23.02	109	147	4000	5300	1.08	HM804840/HM804810
	95.250	30.958	28.300	20.638	82.5	92.0	3700	5000	0.975	53162/53375
	95.250	30.958	28.575	22.225	96.0	116	3700	4900	1.05	HM903245/HM903210
42.070	90.488	39.688	40.386	33.338	136	175	4300	5800	1.24	4395/4335
42.862	82.550	26.195	26.988	20.638	75.5	97.0	4600	6100	0.617	22780/22720
	82.931	23.812	25.400	19.05	76.0	98.0	4500	6000	0.584	25578/25520
	87.312	30.162	30.886	23.812	94.0	117	4400	5900	0.805	3579/3525
42.875	79.375	23.812	25.400	19.05	76.5	97.5	4800	6400	0.51	26884/26822
	82.931	23.812	25.400	19.05	76.0	98.0	4500	6000	0.581	25577/525520
44.450	76.992	17.462	17.145	11.908	44.0	54.0	4700	6300	0.308	12175/12303
	79.375	17.462	17.462	13.495	45.5	56.0	4600	6200	0.345	18685/18620
	82.931	23.812	25.400	19.05	76.0	98.0	4500	6000	0.56	25580/25520
	82.931	23.812	25.400	19.05	76.0	98.0	4500	6000	0.556	25582/25520
	84.138	30.162	30.886	23.812	94.0	117	4400	5900	0.699	3578/3520
	85.000	20.638	21.692	17.462	69.5	79.5	4400	5800	0.511	355/354A
	87.312	30.162	30.886	23.812	94.0	117	4400	5900	0.779	3578/3525
	88.900	30.162	29.370	23.020	93.5	125	4300	5800	0.849	HM803149/HM803110
	93.264	30.162	30.302	23.812	102	134	4000	5300	0.961	3782/3720
	93.662	31.75	31.750	26.195	103	131	4100	5500	1.04	46175/46368
	95.250	27.783	28.575	22.225	107	139	3900	5200	0.987	33885/33821
	95.250	27.783	29.900	22.225	108	129	4200	5600	0.953	438/432

Taper Roller Bearing(Inch)

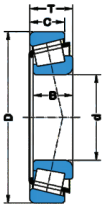
d44.450 - 47.625mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
44.450	95.250	30.162	29.337	23.02	109	147	4000	5300	1.04	HM804882/HM804810
	95.250	30.958	28.300	20.638	82.5	92.0	3700	5000	0.925	53177/53375
	95.250	30.958	28.575	22.225	96.0	116	3700	4900	1	HM903249/HM903210
	101.600	34.925	36.068	26.88	135	162	3800	5000	1.37	527/522
	104.775	30.162	29.317	24.605	115	148	3500	4700	1.29	460/453
	104.775	30.162	30.958	23.812	130	169	3500	4700	1.35	45280/45220
	104.775	36.512	36.512	28.575	138	189	3600	4800	1.62	HM807040/HM807010
	111.125	30.162	26.909	20.638	104	136	3200	4200	1.45	55175C/55437
	111.125	30.162	26.909	20.638	104	136	3200	4200	1.09	55176C/55437
	127.000	50.8	52.388	41.275	250	320	3200	4300	3.58	6277/6220
44.983	82.931	23.812	25.400	19.05	76.0	98.0	4500	6000	0.555	25584/25520
	93.264	30.162	30.302	23.812	102	134	4000	5300	0.952	3776/3720
45.000	85.000	20.638	21.692	17.462	69.5	79.5	4400	5800	0.505	358/354A
	88.900	20.638	22.225	16.513	76.5	90.5	4100	5500	0.595	367/362A
45.237	87.313	30.162	30.886	23.812	94.0	117	4400	5900	0.765	3586/3525
45.242	73.431	19.558	19.812	15.748	54.0	76.0	4800	6400	0.307	LM102949/LM102910
	77.788	19.842	19.842	15.08	57.5	73.5	4600	6200	0.372	LM603049/LM603011
45.618	82.55	23.812	25.400	19.05	76.0	98.0	4500	6000	0.534	25590/25519
	82.931	23.812	25.400	19.05	76.0	98.0	4500	6000	0.543	25590/25520
	83.058	23.876	25.400	19.114	76.0	98.0	4500	6000	0.545	25590/25522
	85.000	23.812	25.400	19.05	76.0	98.0	4500	6000	0.581	25590/25526
45.987	74.976	18.00	18.000	14.00	51.0	71.0	4700	6300	0.296	LM5033491A/ LM503310
46.038	79.375	17.462	17.462	13.495	45.5	56.0	4600	6200	0.329	18690/18620
	82.931	23.812	25.400	19.05	76.0	98.0	4500	6000	0.538	25592/25520
	85.000	20.638	21.692	17.463	69.5	79.5	4400	5800	0.489	359A/354A
	85.000	25.400	28.608	20.638	79.0	104	4400	5800	0.615	2984/2924
	90.119	23.000	21.692	21.808	69.5	79.5	4400	5800	0.651	359S/352
	93.264	30.162	30.302	23.812	102	134	4000	5300	0.934	3777/3720
	95.250	27.783	29.900	22.225	108	129	4200	5600	0.927	436/432
	88.900	20.638	22.225	16.513	76.5	90.5	4100	5500	0.559	369A/362A
	88.900	25.4	25.400	19.050	82.0	101	4200	5600	0.662	M804048/M804010
	93.264	30.162	30.302	23.812	102	134	4000	5300	0.898	3778/3720
	95.250	30.162	29.370	23.020	109	147	4000	5300	0.978	HM804846/HM804810
47.625	96.838	21.000	21.946	15.875	78.0	96.5	3700	5000	0.72	386A/382A
	101.600	34.925	36.068	26.988	135	165	3800	5000	1.3	528/522
	104.775	30.162	29.317	24.605	115	148	3500	4700	1.24	463/453

Taper Roller Bearing(Inch)

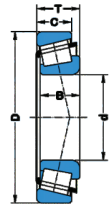
d47.625 - 50.800mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
47.625	104.775	30.162	30.958	23.812	130	169	3500	4700	1.29	45282/45220
	111.125	30.162	26.909	20.638	104	136	3200	4200	1.4	55187C/55437
	123.825	36.512	32.791	25.400	154	188	2900	3900	2.16	72188C/72487
48.412	95.250	30.162	29.370	23.020	109	147	4000	5300	0.967	HM804848/HM804810
	95.250	30.162	29.370	23.020	109	147	4000	5300	0.964	HM804849/HM804810
49.212	93.264	30.162	30.302	23.812	102	134	4000	5300	0.877	3781/3720
	103.188	43.658	44.475	36.512	174	232	3800	5000	1.75	5395/5335
	104.775	36.512	36.512	28.575	138	189	3600	4800	1.52	HM807044/HM807010
	114.300	44.450	44.450	34.925	186	225	3600	4800	2.23	65390/65320
	114.300	44.450	44.450	36.068	203	261	3500	4700	2.33	HH506348/HH506310
49.987	82.550	21.590	22.225	16.510	69.5	94.0	4300	5700	0.434	LM104947A/LM104911
	92.075	24.608	25.400	19.845	83.5	116	4000	5300	0.718	28579/28521
	114.300	44.450	44.450	36.068	203.0	261	3500	4700	2.27	HH506349/HH506310
50.000	82.000	21.500	21.500	17.000	69.5	94.0	4300	5700	0.42	JLM104948/JLM104910
	84.000	22.000	22.000	17.500	69.5	94.5	4300	5700	0.466	JLM704649/JLM704610
	88.900	20.638	22.225	16.513	76.5	90.5	4100	5500	0.53	365/362A
	88.900	20.638	22.225	16.513	76.5	90.5	4100	5500	0.529	366/362A
	90.000	28.000	28.000	23.000	106	141	4100	5400	0.752	JM205149/JM205110
	105.000	37.000	36.000	29.000	138	189	3600	4800	1.52	JHM807045/JHM807012
	110.000	22.000	21.996	18.824	89.5	120	3200	4300	1.06	396/394A
50.800	82.550	21.590	22.225	16.510	69.5	94.0	4300	5700	0.419	LM104949/LM104911
	85.000	17.462	17.462	13.495	49.5	65.0	4200	5600	0.374	18790/18720
	88.900	17.462	17.462	13.495	49.5	65.0	4200	5600	0.431	18790/18724
	88.900	20.638	22.225	16.513	76.5	90.5	4100	5500	0.519	368/362A
	88.900	20.638	22.225	16.513	76.5	90.5	4100	5500	0.511	370A/362A
	90.000	20.000	22.225	20.000	76.5	90.5	4100	5500	0.525	368A/362X
	92.075	24.608	25.400	19.845	83.5	116	4000	5300	0.703	28580/28521
	93.264	30.162	30.302	23.812	102	134	4000	5300	0.852	3775/3720
	93.264	30.162	30.302	23.812	102.0	134	4000	5300	0.848	3780/3720
	95.250	27.783	28.575	22.225	107	139	3900	5200	0.876	33889/33821
	95.250	30.162	30.302	23.812	102	134	4000	5300	0.903	3780/3726
	96.838	21.000	21.946	15.875	78.0	96.5	3700	5000	0.676	385A/382A
	97.630	24.608	24.608	19.446	88.5	128	3700	4900	0.852	28678/28622
	98.425	30.162	30.302	23.812	102	134	4000	5300	0.993	3780/3732
	101.600	31.750	31.750	25.400	110	136	3700	5000	1.13	49585/49520
	101.600	34.925	36.068	26.988	135	165	3800	5000	1.24	529/522

Taper Roller Bearing(Inch)

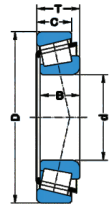
d50.800 - 57.150mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
50.800	104.775	30.162	29.317	24.605	115	148	3500	4700	1.19	455/453
	104.775	30.162	30.958	23.812	130	169	3500	4700	1.22	45284/45220
	104.775	36.512	36.512	28.575	138	189	3600	4800	1.49	HM807046/HM807010
	104.775	36.512	36.512	28.575	143	178	3700	4900	1.44	59200/59412
	107.950	36.512	36.957	28.575	141	177	3600	4800	1.55	537/532
	111.125	30.162	28.575	20.638	104	136	3200	4200	1.36	HM907643/HM907614
	112.712	30.162	26.909	20.638	104	136	3200	4200	1.34	55200C/55443
	112.712	30.162	30.048	23.812	119	174	3200	4300	1.53	3975/3920
	112.712	30.162	30.162	23.812	138	195	3200	4200	1.54	39575/39520
	117.475	33.338	31.750	23.812	130	153	3300	4400	1.67	66200/66462
	120.650	41.275	41.275	31.75	172	213	3300	4400	2.3	619/612
	123.825	36.512	32.791	25.400	154	188	2900	3900	2.1	72200C/72487
	123.825	38.100	36.678	30.162	158	216	3000	4100	2.34	555/552A
51.592	88.900	20.638	22.225	16.513	76.5	90.5	4100	5500	0.507	368S/362A
52.388	92.075	24.608	25.400	19.845	83.5	116	4000	5300	0.677	28584/28521
	93.264	30.162	30.302	23.812	102	134	4000	5300	0.819	3767/3720
	95.250	27.783	28.575	22.225	107	139	3900	5200	0.851	33890/33821
53.975	88.900	19.050	19.050	13.492	61.0	82.5	4000	5300	0.437	LM806649/LM806610
	95.250	27.783	28.575	22.225	107	139	3900	5200	0.824	33895/33822
	96.838	21.000	21.946	15.875	78.0	96.5	3700	5000	0.633	389A/382A
	104.775	30.162	30.958	23.812	130	169	3500	4700	1.17	45287/45220
	104.775	36.512	36.512	28.575	138	189	3600	4800	1.41	HM807049/HM807010
	107.950	36.512	36.957	28.575	141	177	3600	4800	1.47	539/532
	120.650	41.275	41.275	31.750	172	213.0	3300	4400	2.21	621/612
	122.238	33.338	31.750	23.812	134	163	3100	4200	1.79	66584/66520
	122.238	43.658	43.764	36.512	194	283	3100	4100	2.64	5578/5535
	123.825	36.512	32.791	25.400	154	188	2900	3900	2.03	72212C/72487
	123.825	38.100	36.678	30.162	158	216	3000	4100	2.26	557S/552A
	130.175	36.512	33.338	23.812	156	186	2700	3600	2.27	HM911242/HM911210
	140.030	36.512	33.236	23.52	171	212	2600	3400	2.77	78214C/78551
54.488	104.775	36.512	36.512	28.575	138	189	3600	4800	1.4	HM807048/HM807010
55.000	90.000	23.000	23.000	18.500	77.5	109	3900	5300	0.558	JLM506849/JLM506810
	95.000	29.000	29.000	23.500	107	144	3800	5100	0.82	JM207049/JM207010
	96.838	21.000	21.946	15.875	78.0	96.5	3700	5000	0.616	385/382A
	110.000	39.000	39.000	32.000	173	219	3500	4600	1.71	JH307749/JH307710
55.562	97.630	24.608	24.608	19.446	88.5	128	3700	4900	0.774	28680/28622

Taper Roller Bearing(Inch)

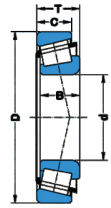
d55.562 - 68.262mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
55.562	123.825	36.512	32.791	25.400	154	188	2900	3900	1.99	72218C/72487
	127.000	36.512	36.512	26.988	163	228	2900	3800	2.34	HM813840/HM813810
55.575	96.838	21.000	21.946	15.875	78	96.5	3700	5000	0.608	389/382A
57.150	96.838	21.000	21.946	15.875	78	96.5	3700	5000	0.583	387/382A
	96.838	21.000	21.946	15.875	78	96.5	3700	5000	0.581	387A/382A
	96.838	21.000	21.946	15.875	78	96.5	3700	5000	0.576	387A/382A
	96.838	21.000	21.946	15.875	78	96.5	3700	5000	585	387A/382
	97.630	24.608	24.608	19.446	88.5	128	3700	4900	0.747	28682/28622
	104.775	30.162	29.317	24.605	115	148	3500	4700	1.06	462/453
	104.775	30.162	29.317	24.605	115	148	3500	4700	1.06	469/453
	104.775	30.162	30.958	23.812	130	169	3500	4700	1.1	45289/45220
	107.950	27.783	29.317	22.225	115	148	3500	4700	1.11	469/453A
	110.000	22.000	21.996	18.824	89.5	120	3200	4300	0.954	390/394A
	110.000	27.795	29.317	27.000	115	148	3500	4700	1.24	469/454
	112.712	30.162	30.048	23.812	119	174	3200	4300	1.4	3979/3920
	112.712	30.162	30.162	23.812	138	195	3200	4200	1.41	39580/39520
	112.712	30.162	30.162	23.812	138	195	3200	4200	1.4	39581/39520
	117.475	30.162	30.162	23.812	117	175	3000	4000	1.58	33225/33462
	117.475	33.338	31.750	23.812	130	153	3300	4400	1.54	66225/66462
	120.650	41.275	41.275	31.75	172	213	3300	4400	2.12	623/612
	123.825	36.512	32.791	25.400	154	188	2900	3900	1.96	72225C/72487
	123.825	38.100	36.678	30.162	158	216	3000	4100	2.18	555S/552A
	140.030	36.512	33.236	23.520	171	212	2600	3400	2.69	78225/78551
57.531	96.838	21.000	21.946	15.875	78.0	96.5	3700	5000	0.575	388A/382A
59.972	122.238	33.338	31.750	23.812	134	163	3100	4200	1.66	66589/66520
59.987	146.050	41.275	39.688	25.400	199	234	2400	3200	3.22	H913840/H913810
60.000	95.000	24.000	24.000	19.000	83.0	122	3700	4900	0.606	JLM508748/JLM508710
	107.950	25.400	25.400	19.050	91.5	140	3200	4300	0.992	29580/29520
	110.000	22.000	21.996	18.824	89.5	120	3200	4300	0.91	397/394A
	130.000	34.100	30.924	22.650	156.0	186	2700	3600	2.01	JHM911244/JHM911211
66.675	130.175	41.275	41.275	31.750	194	262	2800	3800	2.41	641/633
	135.755	53.975	56.007	44.450	278	380	2900	3800	3.64	6386/6320
	136.525	41.275	41.275	31.750	194	262	2800	3800	2.74	641/632
	136.525	41.275	41.275	31.750	226	293	2700	3700	2.75	H414242/H414210
68.262	110.000	22.000	21.996	18.824	89.5	120	3200	4300	0.764	399A/394A
	120.000	29.794	29.007	24.237	128	177	3000	4000	1.37	480/472

Taper Roller Bearing(Inch)

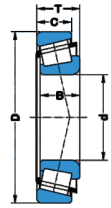
d68.262 - 75.000mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
68.262	123.825	38.100	36.678	30.162	158	216	3000	4100	1.87	560S/552A
	136.525	41.275	41.275	31.750	226	293	2700	3700	2.7	H414245/H414210
	136.525	46.038	46.038	36.512	224	355	2600	3500	3.24	H715343/H715311
69.850	112.712	25.400	25.400	19.050	95.5	151	3100	4100	0.949	29675/29620
	117.475	30.162	30.162	23.812	117	175	3000	4000	1.28	33275/33462
	120.000	29.795	29.007	24.237	128	177	3000	4000	1.33	482/472
	120.000	32.545	32.545	26.195	147	214	3000	4000	1.47	47487/47420
	120.650	25.400	25.400	19.050	95.5	151	3100	4100	1.17	29675/29630
	127.000	36.512	36.170	28.575	163	229	2900	3800	1.92	566/563
	136.525	41.275	41.275	31.750	194	262	2800	3800	2.63	643/632
	146.050	41.275	41.275	31.750	206	295	2500	3300	3.28	655/653
	150.089	44.450	46.672	36.512	261	360	2400	3200	3.92	745A/742
	168.275	53.975	56.363	41.275	340	460	2200	3000	6.13	835/832
69.952	121.442	24.608	23.012	17.462	91.0	127	2900	3800	1.11	34274/34478
70.000	110.000	26.000	25.000	20.500	97.0	150	3200	4200	0.889	JLM813049/JLM813010
	115.000	29.000	29.000	23.000	124	171	3100	4100	1.13	JM612949/JM612910
	120.000	29.794	29.007	24.237	128	177	3000	4000	1.33	484/472
	150.000	41.275	39.688	25.400	199	234	2400	3200	3.08	JH913848/JH913811
71.438	117.475	30.162	30.162	23.812	117	175	3000	4000	1.24	33281/33462
	120.000	32.545	32.545	26.195	147	214	3000	4000	1.42	47490/47420
	127.000	36.512	36.170	28.575	163	229	2900	3800	1.87	567A/563
	136.525	41.275	41.275	31.750	194	262	2800	3800	2.57	644/632
	136.525	41.275	41.275	31.750	226	293	2700	3700	2.58	H414249/H414210
	136.525	46.038	46.038	36.512	224	355	2600	3500	3.11	H715345/H715311
73.025	112.712	25.400	25.400	19.050	95.5	151	3100	4100	0.873	29685/29620
	117.475	30.162	30.162	23.812	117	175	3000	4000	1.19	33287/33462
	127.000	36.512	36.170	28.575	163	229	2900	3800	1.82	567/563
	139.992	36.512	36.098	28.575	178	265	2600	3400	2.53	576/572
	149.225	53.975	54.229	44.450	287	410	2500	3400	4.42	6460/6420
	150.089	44.450	46.672	36.512	261	360	2400	3200	3.79	744/742
73.817	112.712	25.400	25.400	19.050	95.5	151	3100	4100	0.86	29688/29620
	127.000	36.512	36.170	28.575	163	229	2900	3800	1.8	568/563
74.612	139.992	36.512	36.098	28.575	178	265	2600	3400	2.48	577/572
75.000	115.000	25.000	25.000	19.000	94.5	143	3000	4000	0.875	JLM714149/JLM714110
	120.000	31.000	29.500	25.500	131	197	2900	3900	1.29	JLM714249/JM714210
	145.000	51.000	51.000	42.000	287	410	2500	3400	3.81	JH415647/JH415610

Taper Roller Bearing(Inch)

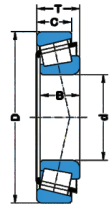
d76.200 - 82.550mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
76.200	109.538	19.050	19.050	15.083	63.0	115	3100	4100	0.579	L814749/L814710
	121.442	24.608	23.012	17.462	91.0	127	2900	3800	0.982	34300/34478
	121.442	24.608	23.012	17.462	91.0	127	2900	3800	0.977	34301/34478
	127.000	30.162	31.000	22.225	135	194	2800	3700	1.46	42687/42620
	133.350	33.338	33.338	26.195	153	235	2600	3500	1.92	47678/47620
	133.350	39.688	39.688	32.545	177	305	2600	3500	2.43	HM516442/HM516410
	135.733	44.450	46.100	34.925	211	330	2700	3500	2.75	5760/5735
	136.525	30.162	29.796	22.225	129	189	2600	3500	1.83	495A/493
	139.992	36.512	36.098	28.575	178	265	2600	3400	2.43	575/572
	139.992	36.512	36.098	28.575	178	265	2600	3400	2.41	575S/572
	146.050	41.275	41.275	31.750	206	295	2500	3300	3.04	659/653
	149.225	53.975	54.229	44.450	287	410	2500	3400	4.23	6461A/6420
	150.089	44.450	46.672	36.512	261	360	2400	3200	3.66	748S/742
	149.225	53.975	54.229	44.450	287	410	2500	3400	4.26	6461/6420
	161.925	53.975	55.100	42.862	310	460	2300	3000	5.44	6576/6535
	180.975	53.975	53.183	35.720	325	415	1900	2600	6.57	H917840/H977810
	190.500	57.150	57.531	46.038	445	610	1900	2600	8.69	HH221430/HH221410
77.788	117.475	25.400	25.400	19.050	99.5	162	2900	3900	0.932	LM814849/LM814810
	121.442	24.608	23.012	17.462	91	127	2900	3800	0.943	34306/34478
	127.000	30.162	31.000	22.225	135	194	2800	3700	1.41	42690/42620
	136.525	30.162	29.769	22.225	129	189	2600	3500	1.78	495AS/493
	136.525	46.038	46.038	36.512	224	355	2600	3500	2.84	H715348/H715311
79.375	146.050	41.275	41.275	31.750	206	295	2500	3300	2.91	661/653
	161.925	47.625	48.260	38.100	270	385	2300	3100	4.55	756A/752
	190.500	57.150	57.531	46.038	445	610	1900	2600	8.52	HH221431/HH221410
80.000	130.000	35.000	34.000	28.500	166	249	2700	3600	1.73	JM515649/JM515610
80.962	133.350	33.338	33.338	26.195	153	235	2600	3500	1.78	47681/47620
	136.525	30.162	29.769	22.225	129	189	2600	3500	1.69	496/493
	139.992	36.512	36.098	28.575	178	265	2600	3400	2.26	581/572
	150.089	44.450	46.672	36.512	261	360	2400	3200	3.43	740/742
82.550	125.412	25.400	25.400	19.845	102	163	2700	3600	1.07	27687/27620
	133.350	33.338	33.338	26.195	153	235	2600	3500	1.72	47686/47620
	133.350	39.688	39.688	32.545	177	305	2600	3500	2.16	HM516448/HM516410
	136.525	30.162	29.769	22.225	129	189	2600	3500	1.64	495/493
	139.992	36.512	36.098	28.575	178	265	2600	3400	2.2	580/572
	139.992	36.512	36.098	28.575	178	265	2600	3400	2.19	582/572
	146.050	41.275	41.275	31.750	206	295	2500	3300	2.78	663/653

Taper Roller Bearing(Inch)

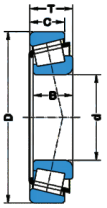
d82.550 - 95.000mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
82.550	150.089	44.450	46.672	36.512	261	360	2400	3200	3.37	749A/742
	152.400	39.688	36.322	30.162	180	279	2300	3100	3.02	595/592A
	152.400	41.275	41.275	31.750	206	295	2500	3300	3.15	663/652
	161.925	47.625	48.260	38.100	270	385	2300	3100	4.42	757/752
	161.925	53.975	55.100	42.862	310	460	2300	3000	5.09	6559C/6535
	168.275	53.975	56.363	41.275	340	460	2200	3000	5.46	842/832
83.345	125.412	25.400	25.400	19.845	102	163	2700	3600	1.06	27689/27620
	125.412	25.400	25.400	19.845	102	163	2700	3600	1.05	27690/27620
	125.412	25.400	25.400	19.845	102	163	2700	3600	1.04	27691/27620
84.138	136.525	30.162	29.769	22.225	129	189	2600	3500	1.6	498/493
85.000	130.000	30.000	29.000	24.000	135	214	2600	3500	1.37	JM716648/JM716610
	140.000	39.000	38.000	31.500	197	297	2500	3400	2.3	JHM516849/JHM516810
85.026	150.089	44.450	46.672	36.512	261	360	2400	3200	3.25	749/742
85.725	133.350	30.162	29.769	22.225	129	189	2600	3500	1.43	497/492A
	142.138	42.862	42.862	34.133	216	350	2500	3300	2.69	HM617049/HM617010
	146.050	41.275	41.275	31.750	206	295	2500	3300	2.65	665/653
	152.400	39.688	36.222	30.162	180	279	2300	3100	2.9	596/592A
	161.925	47.625	48.260	38.100	270	385	2300	3100	4.26	758/752
87.960	148.430	28.575	28.971	21.433	138	215	2300	3100	1.99	42346/42584
88.900	121.442	15.088	15.083	11.112	56.5	88	2700	3600	0.452	LL21784S/LL217810
	123.825	20.638	20.638	16.670	80.0	141	2700	3500	0.737	L217849/L217310
	148.430	28.575	28.971	21.433	138	215	2300	3100	1.96	42350/42584
	152.400	39.688	36.322	30.162	180	279	2300	3100	2.78	593/592A
	161.925	47.625	48.260	38.100	270	385	2300	3100	4.09	759/752
	161.925	53.975	55.100	42.862	310	460	2300	3000	4.73	6580/6535
	168.275	53.975	56.363	41.275	340	460	2200	3000	5.08	850/832
89.974	146.975	40.000	40.000	32.500	227	340	2400	3200	2.55	HM218248/HM218210
90.000	145.000	35.000	34.000	27.000	189	279	2400	3200	2.14	JM718149/JM718110
	155.000	44.000	44.000	35.500	270	385	2300	3100	3.32	JHM318448/JHM318410
	190.000	50.800	46.038	31.750	281	365	1800	2400	6.32	J90354/J90748
90.488	161.925	47.625	48.260	38.100	270	385	2300	3100	4.01	760/752
92.075	146.050	33.338	34.925	26.195	163	266	2400	3100	2.08	47890/47820
	152.400	39.688	36.322	30.162	180	279	2300	3100	2.63	598A/592A
	168.275	41.275	41.275	30.162	222	340	2100	2800	3.87	681/672
93.662	148.430	28.575	28.971	21.433	138	215	2300	3100	1.8	42368/42584
95.000	150.000	35.000	34.000	27.000	180	279	2300	3100	2.19	JM719149/JM719113

Taper Roller Bearing(Inch)

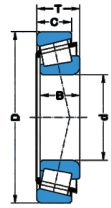
d95.250 - 114.300mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
95.250	130.175	20.638	21.433	16.670	81.0	147	2500	3300	0.789	L319249/L319210
	146.050	33.338	34.925	26.195	163	266	2400	3100	1.95	47896/47820
	152.400	39.688	36.322	30.162	180	279	2300	3100	2.09	594A/592
	148.430	28.575	28.971	21.433	138	215	2300	3100	1.75	42375/42584
	152.400	39.688	36.322	30.162	180	279	2300	3100	2.51	594/592A
	157.162	36.512	36.116	26.195	188	305	2200	2900	2.76	52375/52618
	168.275	41.275	41.275	30.162	222	340	2100	2800	3.72	683/672
	190.500	57.150	57.531	46.038	445	610	1900	2600	7.5	HH221440/HH221410
96.838	148.430	28.575	28.971	21.433	138	215	2300	3100	1.69	42381/42584
	188.912	50.800	46.038	31.750	281	365	1800	2400	5.67	90381/90744
98.425	157.162	36.512	36.116	26.195	188	305	2200	2900	2.62	52387/52618
	168.275	41.275	41.275	30.162	222	340	2100	2800	3.56	685/672
99.974	212.725	66.675	66.675	53.975	575	810	1700	2300	11.5	HH224334/HH224310
100.00	155.000	36.000	35.000	28.000	192	310	2200	2900	2.4	JM720249/JM720210
101.012	157.162	36.512	36.116	26.195	188	305	2200	2900	2.55	52393/52618
101.600	157.162	36.512	36.116	26.195	188	305	2200	2900	2.48	52400/52618
	168.275	41.275	41.275	30.162	222	340	2100	2800	3.4	687/672
	180.975	47.625	48.006	38.100	285	430	2000	2700	5.11	780/772
	190.500	57.150	57.531	44.450	380	555	2000	2600	7	861/854
	190.500	57.150	57.531	46.038	445	610	1900	2600	7.06	HH221449/HH221410
	190.500	57.150	57.531	46.038	445	610	1900	2600	7.06	HH221449A/HH221410
	212.725	66.675	66.675	53.975	475	695	1800	2300	11.2	941/932
	212.725	66.675	66.675	53.975	575	810	1700	2300	11.3	HH224335/HH224310
	158.750	23.020	21.438	15.875	102	166	2100	2800	1.37	37425/37625
107.950	159.987	34.925	34.925	26.988	167	320	2100	2800	2.37	LM522546/LM522510
	165.100	36.512	36.512	26.988	191	315	2100	2700	2.69	56425/56650
	212.725	66.675	66.675	53.975	475	695	1800	2300	10.7	936/932
109.538	158.750	23.020	21.438	15.875	102	166	2100	2800	1.33	37431/37625
109.987	159.987	34.925	34.925	26.988	167	320	2100	2800	2.24	LM522548/LM522510
109.992	177.800	41.275	41.275	30.162	232	375	1900	2600	3.77	64433/64700
110.000	165.000	35.000	35.000	26.500	191	315	2100	2700	2.52	JM822049/JM822010
	180.000	47.000	46.000	38.000	305	480	1900	2600	4.61	JHM522649/JHM522610
111.125	214.312	55.562	52.388	39.688	405	560	1500	2000	8.18	H924045/H924010
114.300	177.800	41.275	41.275	30.162	232	375	1900	2600	3.52	64450/64700
	180.975	34.925	31.750	25.400	169	245	1900	2500	2.93	68450/68712
	212.725	66.675	66.675	53.975	475	695	1800	2300	10.1	938/932

Taper Roller Bearing(Inch)

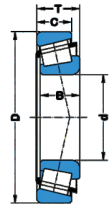
d114.300 - 158.750mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
114.300	212.725	66.675	66.675	53.975	575	810	1700	2300	10.2	HH224346/HH224310
	228.600	53.975	49.428	38.100	430	620	1400	1900	9.76	HM926740/HM926710
115.087	190.500	47.625	49.212	34.925	300	475	1800	2500	5.11	71453/71750
117.475	180.975	34.925	31.750	25.400	169	245	1900	2500	2.78	68462/68712
120.000	170.000	25.400	25.400	19.050	127	210	2000	2600	1.67	JL724348/JL724314
120.650	234.950	63.500	63.500	49.212	525	825	1500	2400	12.6	95475/95925
123.825	182.562	39.688	38.100	33.338	224	435	1800	2400	3.52	48286/48220
127.000	182.562	39.688	38.100	33.338	224	435	1800	2400	3.33	48290/48220
	196.850	46.038	46.038	38.100	310	550	1700	2200	5.1	67388/67322
	215.900	47.625	47.625	34.925	320	540	1600	2100	7.05	74500/74850
	228.600	53.975	49.428	38.100	320	445	1400	1900	8.43	97500/97900
	228.600	53.975	49.428	38.100	430	620	1400	1900	8.83	HM926747/HM926710
	230.000	63.500	63.500	49.212	525	825	1500	2000	12.9	95500/95905
	254.000	77.788	82.550	61.912	740	1070	1400	1900	19.5	HH228349/HH228310
128.588	206.375	47.625	47.625	34.925	315	520	1700	2200	5.77	799/792
	196.850	46.038	46.038	38.100	310	550	1700	2200	4.87	67389/67322
130.175	206.375	47.625	47.625	34.925	315	520	1700	2200	5.65	799A/792
133.350	177.008	25.400	26.195	20.638	126	259	1800	2400	1.7	L327249/L327210
	190.500	39.688	39.688	33.338	236	475	1700	2300	3.64	48385/48320
	196.850	46.038	46.038	38.100	310	550	1700	2200	4.63	67390/67322
	196.850	46.038	46.038	38.100	310	550	1700	2200	4.59	67391/67322
	215.900	47.625	47.625	34.925	320	540	1600	2100	6.56	74525/74850
	234.950	63.500	63.500	49.212	525	825	1500	2000	11.3	95525/95925
136.525	190.500	39.688	39.688	33.338	236	475	1700	2000	3.43	48393/48320
	228.600	57.150	57.150	44.450	445	735	1500	2000	9.07	896/892
139.700	215.900	47.625	47.625	34.925	320	540	1600	2100	6.05	74550/74850
	228.600	57.150	57.150	44.450	445	735	1500	2000	8.76	898/892
	254.000	66.675	66.675	47.625	550	910	1400	1800	14.3	99550/99100
142.875	200.025	41.275	39.688	34.130	239	490	1600	2100	3.85	48684/48620
	200.025	41.275	39.688	34.130	239	490	1600	2100	3.89	48685/48620
146.050	193.675	28.575	28.575	23.020	165	340	1600	2200	2.27	36690/36620
	254.000	66.675	66.675	47.625	550	910	1400	1800	13.5	99575/99100
152.400	192.088	25.000	24.000	19.000	130	261	1600	2100	1.53	L630349/L630310
	222.250	46.830	46.830	34.925	315	585	1500	2000	5.72	M231649/M231610
158.750	205.583	23.812	23.812	18.258	126	247	1500	2000	1.89	L432349/L432310
	225.425	41.275	39.688	33.338	254	555	1400	1900	5.2	46780/46720

Taper Roller Bearing(Inch)

d165.100 - 343.154mm



Boundary Dimensions					Basic Load Rating		Limiting Speeds		WT	Bearing Number
d mm	D	T	B	C	Dynamic C	Static C_0	Grease	Oil		
					kN		RPM		kg	
165.100	225.425	41.275	39.688	33.338	254	555	1400	1900	4.69	46790/46720
170.000	230.000	39.000	38.000	31.000	282	520	1400	1800	4.37	JMH534149/JHM534110
177.800	227.012	30.162	30.162	23.020	181	415	1300	1800	2.92	36990/36920
	247.650	47.625	47.625	38.100	340	690	1300	1700	6.57	67790/67720
180.000	250.000	47.000	45.000	37.000	370	710	1300	1700	6.76	JM736149/JM736110
190.000	260.000	46.000	44.000	36.500	365	720	1200	1600	6.85	JM738249/JM738210
190.475	279.400	52.388	57.150	41.275	523	980	1600	2200	9.5	M239449/410
190.500	282.575	50.800	47.625	36.512	402	695	1600	2200	9.6	87750/87111
191.237	279.400	52.388	58.738	41.275	523	980	1600	2200	9.2	M239448A/410
196.850	241.300	23.812	23.017	17.462	154	315	1700	2600	2	LL639249/210
	241.300	23.812	23.017	17.462	154	315	1700	2600	2	LL639249/2/210/4
	257.175	39.688	39.688	30.162	275	655	1600	2400	5.3	LM739749/710/VE174
200.025	276.225	42.862	46.038	34.133	450	780	1700	2200	7.7	LM241147/110/QVQ051
203.987	276.225	42.862	46.038	34.133	450	780	1700	2200	7.25	LM241148/110/VQ051
206.375	282.575	46.038	46.038	36.512	380	830	1500	2200	8.6	67985/67920/HA3VQ117
215.900	285.750	46.038	46.038	34.924	380	850	1500	2200	7.9	LM742749/710/VE174
216.408	285.750	46.038	49.212	34.924	380	850	1500	2200	7.85	LM742747/710
210.713	285.750	46.038	49.212	34.924	380	850	1500	2200	7.85	LM742747A/710
230.188	317.500	47.625	52.388	36.512	523	980	1300	2000	1.05	LM245846/810
231.775	300.038	33.338	31.750	23.812	216	425	1400	2000	5.3	544091/2B/54418A/213
	317.500	47.625	52.388	36.512	523	980	1300	2000	10.5	LM245848/810
255.600	342.900	57.150	63.500	44.450	594	1220	1200	1800	14	M349547/510
257.175	342.900	57.150	57.150	44.450	594	1220	1200	1800	14	M349549/510VE174
	358.775	71.438	57.150	44.450	842	1760	1200	1700	20.5	M249747/710
263.525	325.438	28.575	28.575	25.400	220	550	1300	1800	53	38880/38820
292.100	374.650	47.625	47.625	34.925	501	1140	1100	1600	1.2012.0	L555249/210
	374.650	47.625	47.625	34.925	501	1140	1100	1600	1.2012.0	L555249/210/VE174
304.800	393.700	50.800	50.800	38.100	528	1220	1000	1500	1405	L357049/010/VE174
343.154	450.850	66.675	66.675	52.388	935	2200	900	1300	28	LM361649A/610

TDO - Double Outer Race

TDO consists of a single piece double outer race and two single inner races. Configuration offers a wide effective bearing spread to support loads created by Overturning moments.

Bearings can be used at fixed positions or allowed to float in the housing bore to Compensate for shaft expansion.

D — CD suffix now replaces the D suffix listed for part numbers in previous publications.

A groove with oil holes is provided for lubrication in suffix outer race.

CD — Outer races can be pinned to prevent circumferential precession in the housing at floating positions (see the following tables for details).

This suffix in current part numbers now replaces the D and DC suffixes listed for part numbers in previous publications.

A groove with oil holes is provided for lubrication in suffix outer races.

DC — Can be pinned to prevent circumferential precession in the housing at floating Positions (see the following tables for details).

Outer races have one lubricant hole. Normally, these are used at floating positions With a fixing pin.

TDO bearings are usually supplied complete with an inner race spacer as a Pre-set assembly.

To suit the application duty, the built-in setting value needs to be established by ZNL representative before an order is placed. The tables list part numbers of plain-ring spacers. If a spacer with provision for lubricant passage is required, consult ZNL representative. To place an order or obtain a price quotation, specify the bearing and spacer part number.

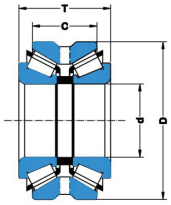
Example:	inner race		outer race
	A 2047	-	A 2120D
	R800003		spacer

Double outer race can be used with any single race from the same series. The tables list regularly specified inner race part numbers.

Taper Roller Bearing(Inch)

d11.987 - 30.000mm

TDO - Double Outer Race

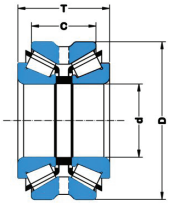


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
11.987	30.480	25.400	21.260	18.500	A2047	A2120D	0.08
14.987	34.987	25.174	20.638	21.200	A4059	A4138D	0.12
16.993	47.000	31.750	25.212	43.100	5066	05185D	0.28
19.050	47.000	31.750	25.212	43.100	05075	05185D	0.26
	57.150	49.212	36.512	74.900	21075	21226D	0.65
19.987	45.984	31.750	25.212	43.100	5079	05180D	0.26
	47.000	31.750	25.212	43.100	5079	05185D	0.26
20.000	50.005	33.340	25.400	46.900	7079	07196D	0.32
23.812	71.438	42.862	36.512	94.700	26093	26282D	0.88
	71.975	42.761	36.512	94.700	26093	26284D	0.9
24.384	80.962	55.562	39.688	125.000	43096	43319D	1.43
24.981	50.005	33.340	25.400	46.900	7098	07196D	0.28
	62.000	39.688	36.258	69.700	17098	17245D	0.6
25.000	50.005	33.340	25.400	46.900	7097	07196D	0.28
	62.000	39.688	36.258	69.700	17098X	17245D	0.6
25.400	50.005	33.400	25.400	46.900	07100-S	07196D	0.27
	50.005	33.400	25.400	46.900	07100-SA	07196D	0.27
	63.500	46.038	36.512	81.400	15100	15251D	0.69
	63.500	46.038	36.512	81.400	15100-S	15251D	0.72
	63.500	46.038	36.512	81.400	15101	15251D	0.72
	71.438	42.862	36.512	94.700	26100	26282D	0.87
	71.975	42.761	36.512	94.700	26100	26284D	0.88
28.575	63.500	46.038	36.512	81.400	15112	15251D	0.66
	66.421	44.453	38.100	90.100	24112	24262D	0.7
	69.850	66.675	57.150	135.000	2578	2524YD	1.19
	71.438	42.862	36.512	94.700	26112	26282D	0.83
	71.975	42.761	36.512	94.700	26112	26284D	0.84
	76.200	47.625	38.100	106.000	02872	02823D	1.13
	80.962	55.562	39.688	125.000	43112	43319D	1.37
29.987	62.000	39.688	36.258	69.700	17118	17245D	0.54
	63.500	46.038	36.512	81.400	15117	15251D	0.65
	71.438	42.862	36.512	94.700	26118	26282D	0.81
	71.975	42.761	36.512	94.700	26118	26284D	0.84
	80.962	55.562	39.688	125.000	43117	43319D	1.31
30.000	69.012	46.040	38.100	88.000	14117A	14276D	0.79
	69.012	46.040	38.100	88.000	14118	14276D	0.79

Taper Roller Bearing(Inch)

d30.162 - 34.925mm

TDO - Double Outer Race

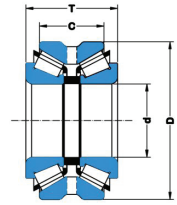


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
30.162	58.738	32.542	24.608	51.100	8118	08231D	0.37
	62.000	39.688	36.258	69.700	17119	17245D	0.53
	66.421	44.453	38.100	90.100	24118	24262D	0.59
	69.850	66.675	57..15	135.000	2558	2524YD	1.16
	80.035	46.040	34.925	102.000	28118	28318D	1.1
	80.962	55.562	39.688	125.000	43118	43319D	1.33
30.213	63.500	46.038	36.512	81.400	15118	15251D	0.62
	63.500	46.038	36.512	81.400	15119	15251D	0.65
31.750	58.738	32.542	24.608	51.100	8125	08231d	0.36
	63.500	44.259	36.512	81.400	15123	15251D	0.59
	63.500	46.038	36.512	81.400	15125	15251D	0.61
	63.500	46.038	36.512	81.400	15126	15251D	0.62
	69.012	46.040	38.100	88.000	14125A	14276D	0.76
	69.850	66.675	57.150	135.000	2580	2524YD	1.18
	69.850	66.675	57.150	135.000	2582	2524YD	1.13
	76.200	47.625	38.100	106.000	2875	02823D	1.05
	76.200	47.625	38.100	106.000	2876	02823D	1.06
	80.962	55.562	39.688	125.000	43125	43319D	1.31
	82.550	66.678	55.562	169.000	3476	3423D	1.84
32.004	71.438	42.862	36.512	94.700	26126	26282D	0.78
	71.975	42.761	36.512	94.700	26126	26284D	0.79
33.338	69.012	46.040	38.100	88.000	14131	14276D	0.74
	69.850	66.675	57.150	135.000	2581	2523D	1.1
	69.850	66.675	57.150	135.000	2581	2524YD	1.1
	69.850	66.675	57.150	135.000	2585	2523D	1.13
	69.850	66.675	57.150	135.000	2585	2524YD	1.09
	71.438	42.862	36.512	94.700	26131	26282D	0.76
	71.438	42.862	36.512	94.700	26132	26282D	0.76
	71.975	42.761	36.512	94.700	26131	26284D	0.78
	71.975	42.761	36.512	94.700	26132	26284D	0.77
	73.025	42.862	35.522	85.700	25132	25289D	0.87
	80.962	55.562	39.688	125.000	43131	43319D	1.26
	80.962	55.562	39.688	125.000	43132	43319D	1.27
34.925	69.012	46.040	38.100	88.000	14137A	14276D	0.71
	69.012	46.040	38.100	88.000	14138A	14276D	0.71
	76.200	47.625	38.100	106.000	2877	02823D	1
	76.200	47.625	38.100	106.000	2878	02823D	1.02

Taper Roller Bearing(Inch)

d34.925 - 40.000mm

TDO - Double Outer Race

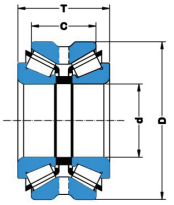


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
34.925	80.035	46.040	34.925	102.000	28137	28318D	1.05
	80.035	57.150	44.958	126.000	27875	27820D	1.3
	95.250	61.915	50.800	205.000	449	432D	2.28
34.975	69.012	46.040	38.100	88.000	14139	14276D	0.71
	80.035	46.040	34.925	102.000	28138	28318D	1.02
35.000	95.250	61.915	50.800	205.000	441	432D	2.26
36.512	69.012	46.035	38.100	91.400	13682	13621D	0.66
	69.012	46.035	38.100	91.400	13682	13621DC	0.71
	82.550	66.678	55.562	169.000	3479	3423D	1.71
	82.931	57.150	47.625	146.000	25570	25520D	1.53
	92.075	55.562	39.688	136.000	44143	44363D	1.72
38.100	63.500	38.100	31.750	43.800	13889	1385D	0.42
	69.012	46.035	38.100	91.400	13685	13621DC	0.68
	69.012	46.035	38.100	91.400	13685	13621D	0.65
	69.012	46.035	38.100	91.400	13687	13621D	0.66
	80.335	46.040	34.925	102.000	28150	28318D	0.98
	80.035	46.040	34.925	102.000	23151	28318D	0.95
	80.035	57.150	44.958	126.000	27880	278200	1.22
	80.035	57.150	44.958	126.000	27881	278200	1.21
	82.550	66.678	55.562	169.000	3490	3423D	1.65
	82.931	57.150	47.625	146.000	25572	25520D	1.48
	92.075	55.562	39.688	136.000	44150	44363D	1.67
	95.250	61.915	50.800	205.000	440	432D	2.19
	95.250	61.915	50.800	205.000	444	432D	2.18
	95.250	63.500	52.385	209.000	33880	33821D	2.25
	92.250	65.088	44.450	16.100	53150	53376D	2.11
	111.125	79.375	63.500	277.000	542	533D	3.98
38.481	63.500	38.100	31.750	43.800	13890	13835D	0.41
39.688	92.075	55.562	39.688	136.000	44156	44363D	1.6
	92.075	55.562	39.688	136.000	44158	44363D	1.59
39.980	80.035	43.459	34.925	102.000	28156	28318D	0.9
	80.035	46.040	34.925	102.000	28159	28318D	0.94
40.000	80.035	46.040	34.925	102.000	28158	28318d	0.95
	90.119	50.795	44.450	132.000	350	353d	1.46
	90.119	50.795	44.450	132.000	350	353DC	1.52
	90.119	50.795	44.450	132.000	350A	353D	1.54
	90.119	50.795	44.450	132.000	357	353D	1.53

Taper Roller Bearing(Inch)

d40.000 - 45.000mm

TDO - Double Outer Race

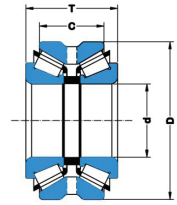


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
40.000	92.075	55.562	39.688	136.000	44157	44363D	1.59
	95.250	61.915	50.800	205.000	442-S	432D	2.12
41.275	76.200	49.212	39.688	122.000	24780	24720D	0.93
	76.200	49.212	39.688	122.000	24780	24720XD	0.93
	90.000	50.010	42.070	138.000	365A	363D	1.41
	92.075	55.562	39.688	136.000	44162	44363D	1.59
	95.250	61.915	50.800	205.000	447	432D	2.11
	95.250	65.088	44.450	161.000	53162	53376D	1.96
	107.950	65.090	53.975	219.000	464	452D	3.08
	111.125	79.375	63.500	277.000	541	533D	3.86
42.850	107.950	65.090	53.975	219.000	461	452D	2.97
42.862	82.550	44.450	34.925	105.000	22168	22325D	1.01
	82.931	57.150	47.625	146.000	25578	25520D	1.33
44.450	79.375	41.272	33.338	83.800	18685	18620D	0.78
	82.931	57.150	47.625	146.000	25580	25520DC	1.31
	82.931	57.150	47.625	146.000	25580	25520D	1.31
	82.931	57.150	47.625	146.000	25581	25520D	1.32
	90.119	50.795	44.450	132.000	365	353D	1.41
	90.119	50.795	44.450	132.000	355A	353D	1.41
	90.119	50.795	44.450	132.000	355X	353D	1.37
	90.119	50.795	44.450	132.000	355X	353DC	1.37
	93.264	65.068	52.388	197.000	3782	3729D	2.05
	95.250	61.915	50.800	205.000	435	432D	2
	95.250	61.915	50.800	205.000	438	432D	1.98
	95.250	63.500	52.385	209.000	33885	33821D	2.12
	95.250	65.088	44.450	161.000	53176	53376D	1.5
	95.250	65.088	44.450	161.000	53177	53376D	1.88
	95.250	65.088	44.450	161.000	53177	53376D	1.88
	95.250	65.088	44.450	161.000	53178	53376D	1.89
	107.950	65.090	53.975	219.000	460	452D	2.91
	111.125	79.375	63.500	277.000	535	533D	3.74
	112.712	65.088	46.038	172.000	55175	55444D	3.03
44.983	82.931	57.150	47.625	146.000	25584	25520D	1.3
	93.264	65.088	52.388	197.000	3776	3729D	2.03
45.000	90.000	50.100	42.070	138.000	367	363D	1.34
	90.119	50.795	44.450	132.000	358	353D	1.4
	90.119	50.795	44.450	132.000	358A	353D	1.39

Taper Roller Bearing(Inch)

d45.000 - 50.800mm

TDO - Double Outer Race

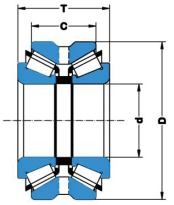


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
45.000	100.000	50.800	39.690	142.000	376X	372D	1.76
45.618	82.931	57.150	47.625	146.000	25590	25520D	1.27
46.038	79.375	41.272	33.338	83.800	18690	18620DC	0.74
	79.375	41.272	33.338	83.000	18690	18620D	0.74
	90.119	50.795	44.450	132.000	359A	353D	1.33
	90.119	50.795	44.450	132.000	359S	353D	1.36
	95.250	61.915	50.800	205.000	436	432D	1.95
47.625	90.000	50.010	42.070	138.000	369A	363D	1.26
	90.000	50.010	42.070	138.000	369S	363D	1.27
	93.264	65.088	52.388	197.000	3778	3729D	1.88
	93.264	65.088	52.388	197.000	3779	3729D	1.94
	100.000	49.200	39.675	147.000	386A	384ED	1.75
	100.000	52.388	42.862	147.000	386A	384D	1.84
	107.950	65.090	53.975	219.000	463	452D	2.79
	107.950	65.090	53.975	219.000	467	452D	2.89
	109.982	63.500	42.865	172.000	55187	55433D	2.77
	111.125	79.375	63.500	277.000	536	533D	3.6
	112.712	65.088	46.038	172.000	55187	55444D	2.91
	117.475	73.025	53.975	240.000	66187	66462D	3.77
	123.825	77.788	55.562	266.000	72187	72488D	4.36
49.212	93.264	65.088	52.388	197.000	3781	3729D	1.88
	111.125	79.375	63.500	277.000	545	533D	3.53
49.975	109.982	63.500	42.865	172.000	55197	55433D	2.69
	112.712	65.088	46.038	172.000	55197	55444D	2.83
49.982	111.125	79.375	63.500	277.000	546	533D	3.5
50.000	90.000	50.010	42.070	138.000	365	365D	1.2
	90.000	50.010	42.070	138.000	365	363DC	1.24
	90.000	50.010	42.070	138.000	366	363D	1.2
	110.000	52.388	46.038	159.000	396	394D	2.31
50.800	80.962	42.865	34.925	98.000	L305649	L305610D	0.78
	89.985	50.400	49.949	138.000	368A	362XD	1.27
	90.000	50.010	42.070	138.000	368	363D	1.18
	90.000	50.010	42.070	138.000	368A	363DC	1.21
	90.000	50.010	42.070	138.000	368A	363D	1.17
	93.264	65.088	52.388	197.000	3775	3729DC	1.81
	93.264	65.088	52.388	197.000	3775	3729D	1.84
	93.264	65.088	52.388	197.000	3780	3729DC	1.82

Taper Roller Bearing(Inch)

d50.800 - 55.000mm

TDO - Double Outer Race

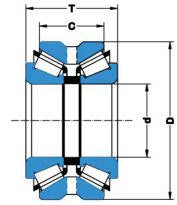


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
50.800	93.264	65.088	52.388	197.000	3780	3729D	1.82
	93.264	65.088	52.388	197.000	3784	3729D	1.78
	95.250	63.500	52.385	209.000	33889	33821DC	1.85
	95.250	63.500	52.385	209.000	33889	33821D	1.85
	100.000	49.200	39.675	147.090	385A	384EDC	1.62
	100.000	49.200	39.675	147.000	385A	384ED	1.62
	100.000	52.388	42.862	147.000	385A	384D	1.76
	107.950	65.090	53.975	219.000	455	452D	2.77
	107.950	65.090	53.975	219.000	455-S	452D	2.75
	109.982	63.500	42.865	172.000	55200	55433D	2.68
	109.982	63.500	42.865	206.000	55200C	55443D	2.85
	110.000	52.388	46.038	159.000	398	394D	2.29
	112.712	65.088	46.038	172.000	55200	55444D	2.79
	117.475	73.025	53.975	240.000	66200	66462D	3.65
	123.825	77.785	55.562	291.000	72200C	72488D	4.34
	123.825	79.375	63.500	307.000	555	552D	4.77
51.592	90.000	50.010	42.010	138.000	368-S	363D	1.15
52.388	93.264	65.088	52.388	197.000	3767	3729D	1.77
	95.250	63.500	52.385	209.000	33890	33821D	1.82
	95.250	63.500	52.385	209.000	33891	33821D	1.8
	107.950	65.090	53.975	219.000	468	452D	2.64
	109.982	63.500	42.865	172.000	55206	55433D	2.6
	111.125	79.375	63.500	277.000	540	533D	3.39
	112.712	65.088	46.038	172.000	55206	55444D	2.71
53.975	95.250	63.500	52.385	209.000	33895	33821D	1.74
	100.000	49.200	39.675	147.000	389A	384ED	1.55
	100.000	52.388	42.862	147.000	389A	384D	1.66
	107.950	65.090	53.975	219.000	456	452DC	2.57
	107.950	65.090	53.975	219.000	456	452D	2.61
	111.125	79.375	63.500	277.000	539	533D	3.35
	117.475	73.025	53.975	24.000	66212	66462D	3.57
	123.825	79.375	63.500	307.000	557-S	552D	4.64
	136.525	95.250	76.200	376.000	636	632D	6.71
	139.700	77.790	51.803	322.000	78215C	78549D	5.84
54.987	107.950	65.090	53.975	219.000	466	452D	2.58
55.000	100.000	49.200	39.675	147.000	385	384EDC	1.5
	100.000	49.200	39.675	147.000	385	384ED	1.5

Taper Roller Bearing(Inch)

d55.000 - 60.000mm

TDO - Double Outer Race

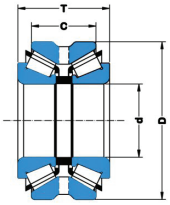


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
55.000	100.000	49.200	39.675	147.000	385X	384ED	1.49
	100.000	52.388	42.862	147.000	385	384D	1.61
	100.000	52.388	42.862	147.000	385X	384D	1.6
	120.000	65.090	53.975	231.000	475	472DC	3.65
	120.000	65.090	53.975	231.000	475	472D	3.65
55.562	107.950	65.090	53.975	219.000	466-S	452DC	2.52
	107.950	65.090	53.975	219.000	466-S	452D	2.56
55.575	100.000	49.200	39.675	147.000	389	384ED	1.49
57.150	92.075	42.070	34.130	101.000	L507949	L507914D	1.08
	100.000	49.200	39.675	147.000	387	384ED	1.44
	100.000	49.200	39.675	147.000	387A	384EDC	1.43
	100.000	49.200	39.675	147.000	387A	384ED	1.43
	100.000	49.200	39.675	147.000	387AS	384ED	1.41
	100.000	49.200	39.675	147.000	387-S	384ED	1.45
	100.000	52.388	42.862	147.000	387	384D	1.54
	100.000	52.388	42.862	147.000	387A	384D	1.53
	100.000	52.388	42.862	147.000	387AS	384D	1.51
	100.000	52.388	42.862	147.000	387-S	384DC	1.55
	100.000	52.388	42.862	147.000	387-S	384D	1.55
	100.000	105.131	95.606	147.000	387A	384XD	2.9
	107.950	65.090	53.975	219.000	462	452DC	2.51
	107.950	65.090	53.975	219.000	462	452D	2.51
	107.950	65.090	53.975	219.000	469	452D	2.5
	110.000	52.388	46.038	159.000	390	394D	2.12
	114.287	58.738	46.038	178.000	29665	29622D	2.71
	117.475	73.025	53.975	240.000	66225	66462D	3.34
	123.825	77.785	55.562	291.000	72225C	72488D	4.15
	123.825	79.375	63.500	307.000	555-S	552D	4.47
	136.525	95.250	76.200	376.000	635	632D	6.77
	139.700	77.788	51.803	276.000	78225	78549D	5.41
57.531	100.000	49.200	39.675	147.000	388A	384ED	1.46
	100.000	52.388	42.862	147.000	388A	384D	1.51
59.972	129.982	69.850	47.625	249.000	66589	66522D	3.94
59.977	100.000	55.560	44.450	171.000	28980	289210D	1.66
59.987	123.825	79.375	63.500	307.000	558-S	552D	4.31
60.000	110.000	52.388	46.038	159.000	397	394DC	2.01
	110.000	52.388	46.038	159.000	397	394D	2.01

Taper Roller Bearing(Inch)

d60.000 - 66.675mm

TDO - Double Outer Race

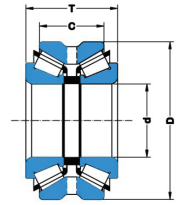


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
60.000	120.000	65.090	53.975	231.000	476	472D	3.42
	129.982	69.850	47.625	249.000	66585	66522D	3.92
60.325	100.000	55.560	44.450	171.000	28985	28921DC	1.65
	100.000	55.560	44.450	171.000	28985	28921D	1.65
	123.825	79.375	63.500	307.000	558	552DC	4.31
	123.825	79.375	63.500	307.000	558	552D	4.31
	123.825	79.375	63.500	307.000	558A	552D	4.29
	136.525	95.250	76.200	376.000	637	632D	6.55
61.912	110.000	52.388	46.038	159.000	392	394D	1.97
	123.825	79.975	63.500	307.000	554	552D	4.17
61.976	100.000	53.975	44.450	171.000	28990	28921D	1.58
62.738	100.000	55.560	44.450	171.000	28995	28921DC	1.55
	100.000	55.560	44.450	171.000	28995	28921D	1.55
63.500	94.458	42.860	34.925	108.000	L610549	L610510D	0.97
	110.000	52.388	46.038	159.000	390A	394DC	1.9
	110.000	52.388	46.038	159.000	390A	394D	1.9
	110.000	52.388	46.038	159.000	395	394DC	1.88
	110.000	52.388	46.038	159.000	395	394D	1.88
	112.712	55.562	42.862	178.000	79586	29526D	2.19
	117.475	66.675	53.975	223.000	33251	33462D	3.18
	120.000	65.090	53.975	231.000	477	472D	3.28
	120.000	65.090	53.975	231.000	483	472DC	3.26
	120.000	65.090	53.975	231.000	483	472D	3.26
	123.825	79.375	63.500	307.000	559	552DC	4.25
	123.825	79.375	63.500	307.000	559	552D	4.25
	127.000	80.962	65.088	317.000	565	563D	4.53
	136.525	95.250	76.200	376.000	639	632D	6.31
	139.700	77.788	51.803	276.000	78250	78549D	5.1
	155.575	101.600	85.725	512.000	745-S	742D	9.86
64.960	152.400	95.250	76.200	398.000	656	654DC	8.33
	155.575	101.600	85.725	512.000	747-S	742D	9.72
64.963	127.000	80.962	65.088	317.000	569	563D	4.44
64.987	139.700	77.788	51.803	276.000	78255X	78549D	4.99
65.000	120.000	65.090	53.975	231.000	478	472D	3.18
66.675	110.000	52.388	46.038	159.000	395A	394D	1.76
	110.000	52.388	46.038	159.000	395-S	394DC	1.76
	110.000	52.388	46.038	159.000	395-S	394D	1.76

Taper Roller Bearing(Inch)

d66.675 - 71.438mm

TDO - Double Outer Race

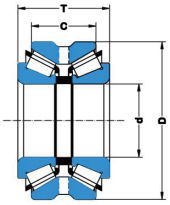


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
66.675	117.475	66.675	53.975	223.000	33262	33462D	2.96
	120.000	65.090	53.975	231.000	479	472D	3.1
	123.825	79.375	63.500	307.000	560	552DC	3.9
	123.825	79.375	63.500	307.000	560	552D	3.9
	136.525	95.250	76.200	376.000	641	632D	6.08
68.262	110.000	52.388	46.038	159.000	399A	394D	1.69
	110.000	52.388	46.038	159.000	399AS	394DC	1.65
	110.000	52.388	46.038	159.000	399AS	394D	1.65
	120.000	65.090	53.975	231.000	480	472D	3
	123.825	79.375	63.500	307.000	560-S	5520DC	3.79
	123.825	79.375	63.500	307.000	560-S	552D	3.79
	127.000	80.962	65.088	317.000	570	563D	4.23
	136.525	95.260	76.200	376.000	642	632D	5.93
	161.925	105.562	70.637	480.000	9278	9220D	9.41
69.850	114.287	58.738	46.038	178.000	29675	29622DC	2.25
	114.287	58.738	46.038	178.000	29675	29622D	2.25
	117.475	66.675	53.975	223.000	33275	33462DC	2.8
	117.475	66.675	53.975	223.000	33275	33462D	2.8
	120.000	65.090	53.975	231.000	482	472D	2.92
	120.000	71.438	58.738	288.000	47487	47420D	3.12
	127.000	80.962	65.088	317.000	566	563D	4.16
	136.525	95.250	76.200	376.000	643	632D	5.82
	152.400	95.250	76.200	393.000	655	654D	8.08
	155.575	101.600	85.725	512.000	744A	742D	9.31
	155.575	101.600	85.725	512.000	745A	742D	9.15
	171.450	125.412	100.012	659.000	835	834D	14.37
69.914	177.800	109.538	74.612	494.000	9382	9320D	12.79
69.952	121.442	52.390	38.100	165.000	34274	34478D	2.26
70.000	120.000	65.090	53.975	231.000	484	472DC	2.92
	120.000	65.090	53.975	231.000	484	472D	2.92
70.637	114.287	58.738	46.038	178.000	29680	29622DC	2.2
	114.287	58.738	46.038	178.000	29680	29622D	2.2
71.438	117.475	66.675	53.975	223.000	33281	33462D	2.72
	120.000	71.438	58.738	288.000	47490	47420D	3.02
	127.000	80.962	65.088	317.000	567A	563D	4.02
	127.000	80.962	65.088	317.000	567-S	563D	3.97
	136.525	69.850	53.975	249.000	495-S	493D	4.4

Taper Roller Bearing(Inch)

d71.438 - 77.788mm

TDO - Double Outer Race

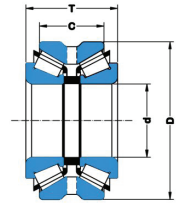


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
71.438	136.525	95.250	76.200	376.000	644	632D	5.72
	136.525	95.250	76.200	376.000	645	632D	5.65
73.025	114.287	58.738	46.038	178.000	29685	29622DC	2.09
	114.287	58.738	46.038	178.000	29685	29622D	2.09
73.025	117.475	66.675	53.975	223	33287	33462D	2.62
	120.000	79.908	67.285	223	33287	33472DC	3.32
	127.000	80.962	65.088	317	567	563D	3.92
	127.000	80.962	65.088	317	567X	563D	3.93
	139.992	82.550	66.675	333	576	572D	5.47
	152.400	95.250	76.200	398	657	654D	7.81
	155.575	101.600	85.725	512	744	742D	9.05
73.817	114.287	58.738	46.038	178	29688	29622D	2.05
	127.000	80.962	65.088	317	568	563D	3.89
74.612	139 992	82.550	66.675	333	577	572D	5.4
74.976	121.442	52.390	38.100	165	34294	34478D	2.03
76.200	109.538	42.860	34.925	112	L814749	L814710D	1.26
	121.442	52.390	38.100	165	34300	34478D	1.98
	121.442	52.390	38.100	165	34301	34478D	1.96
	136.525	69.850	53.975	249	495A	493DC	4.07
	136.525	69.850	53.975	249	495A	493D	4.07
	139.992	82.550	66.675	333	575	572DC	5.27
	139.992	82.550	66.675	333	575	572D	5.27
	152.400	82.550	63.500	348	590A	592D	6.81
	152.400	95.250	76.200	398	659	654DC	7.53
	152.400	95.250	76.200	398	659	654D	7.53
	155.575	101.600	85.725	512	748-S	742DC	8.75
	155.575	101.600	85.725	512	748-S	742D	8.75
	161.925	104.775	85.725	528	755	752D	10.1
	161.925	105.562	70.637	480	9285	9220D	8.66
	171.450	125.412	100.012	659	837	834D	13.52
	171.450	125.412	100.012	659	843	834D	13.48
	177.800	109.538	74.612	494	9380	9320D	12.15
76.200	177.800	115.888	74.612	494	9378	9320D	12.69
	190.500	127.000	104.775	860	HH221430	HH221410D	18.92
77.788	121.442	52.390	38.100	165	34306	34478D	1.87
	136.525	69.850	53.975	249	495AS	493DC	3.99

Taper Roller Bearing(Inch)

d77.788 - 85.725mm

TDO - Double Outer Race

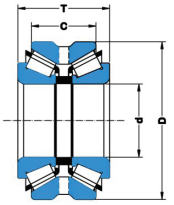


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
77.788	136.525	69.850	53.975	249	495AS	493D	3.99
79.375	152.400	82.550	63.500	348	595A	592D	6.54
	152.400	95.250	76.200	398	661	654D	7.07
	152.400	95.250	76.200	398	661	654DC	7.24
	155.575	101.600	85.725	512	750	742D	8.33
79.985	139.992	82.550	66.675	333	578	572D	4.96
	152.400	82.550	63.500	348	590	592D	6.53
80.000	155.575	101.600	85.725	512	748	742D	8.36
	200.025	115.888	80.216	655	98316	98789D	17.29
80 962	136.525	69.850	53.975	249	496	493D	3.76
	139.992	82.550	66.675	333	581	572D	4.88
	152.400	88.900	76.200	398	662	654D	6.77
	155.575	101.600	85.725	512	740	742D	8.16
82.550	115.888	47.625	39.690	145	L116149	L116110DC	1.43
	115.888	47.625	39.690	145	L116149	L116110D	1.43
	136.525	69.850	53.975	249	495	493DC	3.65
	136.525	69.850	53.975	249	495	493D	3.65
	139.992	82.550	66.675	333	580	572D	4.76
	139.992	82.550	66.675	333	582	572D	4.68
	152.400	82.550	63.500	348	595	592DC	6.42
	152.400	82.550	63.500	348	595	592D	6.42
	152.400	95.250	76.200	398	663	654D	6.94
	155.575	101.600	85.725	512	749A	742D	8.12
	161.925	104.775	85.725	528	757	752D	9.43
	171.450	125.412	100.012	659	842	834D	12.90
83.345	125.412	55.560	44.450	189	27690	27620DA	2.30
84.138	136.525	69.850	53.975	249	498	493D	3.53
	152.400	95.250	76.200	398	664	654D	6.80
	177.800	109.538	74.612	494	9386H	9320D	11.28
85.000	200.025	115.888	80.216	655	98335	98789D	16.86
85.026	155.575	101.600	85.725	512	749	742DC	7.90
	155.575	101.600	85.725	512	749	742D	7.90
85.725	136.525	69.850	53.975	249	497	493DC	3.43
	136.525	69.850	53.975	249	497	493D	3.43
	152.400	82 550	63.500	348	596	592DC	6.10
	152.400	82.550	63.500	348	596	592D	6.10
	152.400	95.250	76.200	398	665	654D	6.68

Taper Roller Bearing(Inch)

d85.725 - 93.662mm

TDO - Double Outer Race

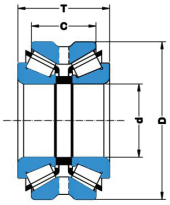


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
85.725	161.925	104.775	85.725	528	758	752D	9.06
	168.275	92.075	69.850	427	677	672D	9.18
	171.450	125.412	100.012	659	841	834D	12.58
87.312	123.825	50.797	42.862	149	L217847	L217810D	1.78
	152.400	82.550	63.500	348	596-S	592D	5.99
	190.500	127.000	104.775	860	HH221432	HH221410DC	17.58
	190.500	127.000	104.775	860	HH221432	HH221410D	17.58
87.960	149.225	66.672	52.388	263	42346	42587D	4.57
88.900	123.825	50.797	42.862	149	L217849	L217810DC	1.69
	123.825	50.797	42.862	149	L217849	L217810D	1.69
	149.225	66.672	52.388	263	42350	42587D	4.50
	152.400	82.550	63.500	348	593	592DC	5.84
	152.400	82.550	63.500	348	593	592D	5.84
	152.400	82.550	63.500	348	593A	592D	5.78
	161.925	104.775	85.725	528	759	752D	8.71
	161.925	104.775	85.725	528	766	752D	8.52
	168.275	92.075	69.850	427	679	672DC	8.86
	168.275	92.075	69.850	427	679	672D	8.86
	171.450	125.412	100.012	659	850	834D	12.21
	180.975	104.775	85.725	558	775	774D	12.13
	190.500	127.000	104.775	860	HH221434	HH221410D	17.36
	200.025	115.888	80.216	655	98350	98789D	16.33
89.891	171.450	125.412	100.012	659	850A	834D	12.08
89.916	189.967	85.852	54.102	462	HM921343	HM921310D	10.44
89.980	161.900	69.850	44.450	327	M919048	M919010D	5.40
90.488	161.925	104.775	85.725	528	760	752D	8.56
92.075	149.225	66.672	52.388	263	42362	42587DC	4.28
	149.225	66.672	52.388	263	42362	42587D	4.28
	152.400	82.550	63.500	348	598	592DC	5.55
	152.400	82.550	63.500	348	598	592D	5.55
	152.400	82.550	63.500	348	598X	592DC	5.54
92.075	152.400	82.550	63.500	348	598X	592D	5.54
	168.275	92.075	69.850	427	681	672D	8.53
	180.975	104.775	85.725	558	778	774D	11.73
93.662	149.225	66.672	52.388	263	42368	42587D	4.17
	152.400	82.550	63.500	348	597	592D	5.41

Taper Roller Bearing(Inch)

d95.250 - 101.600mm

TDO - Double Outer Race

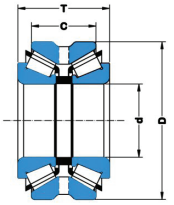


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
95.250	130.175	47.622	39.688	154	L319249	L319210D	1.75
	136.525	68.260	57.150	225	LM119348	LM119311D	2.98
	149.225	66.672	52.388	263	42375	42587D	4.05
	149.225	66.672	52.388	263	42376	42587DC	3.94
	149.225	66.672	52.388	263	42376	42587D	4.02
	152.400	82.550	63.500	348	594	592DC	5.26
	152.400	82.550	63.500	348	594	592D	5.26
	152.400	82.550	63.500	348	594A	592D	5.23
	161.925	82.547	61.912	360	52375	52637D	6.50
	168.275	92.075	69.850	427	683	672DC	8.19
	168.275	92.075	69.850	427	683	672D	8.19
	180.975	104.775	85.725	558	776	774D	11.37
	180.975	104.775	85.725	558	777	774D	10.97
	190.500	127.000	104.775	860	HH221440	HH221410D	16.44
96.838	149.225	66.672	52.388	263	42381	42587DC	3.91
	149.225	66.672	52.388	263	42381	42587D	3.91
98.425	161.925	82.547	61.912	360	52387	52637D	6.18
	168.275	92.075	69.850	427	685	672DC	7.90
	168.275	92.075	69.850	427	685	672D	7.90
	180.000	104.775	85.725	558	779	773D	10.86
	180.975	104.775	85.725	558	779	774D	10.98
	190.500	127.000	104.775	860	HH221442	HH221410D	16.09
	212.725	142.875	117.475	1100	HH224332	HH224310CD	23.31
99.975	212.725	142.875	117.475	1100	HH224334	HH224310CD	23.13
99.980	196.850	103.378	74.422	608	HM821547	HM821511D	12.48
99.982	190.500	127.000	104.775	860	HH221447	HH221410D	15.77
100.000	180.000	104.775	85.725	558	783	773D	10.68
	180.975	104.775	85.725	553	783	774D	10.78
	190.500	127.000	101.600	738	863X	854DC	15.05
	200.025	115.888	80.216	655	98394X	98789D	14.94
100.012	161.925	82.547	61.912	360	52393	52637D	6.02
101.600	146.050	49.210	38.895	219	LM520349	LM520310D	2.43
	146.050	49.212	39.688	155	L521945	L521910D	2.54
	161.925	82.547	61.912	360	52400	52637DC	5.89
	161.925	82.547	61.912	360	52400	52637D	5.89
	161.925	82.547	61.912	360	52401	52637D	5.89
	168.275	92.075	69.850	427	687	672DC	7.64

Taper Roller Bearing(Inch)

d101.600 - 110.000mm

TDO - Double Outer Race

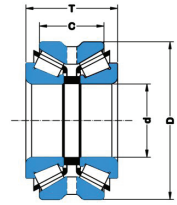


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
101.600	168.275	92.075	69.850	427	687	672D	7.64
	180.000	104.775	85.725	558	780	773DC	10.69
	180.000	104.775	85.725	558	780	773D	10.69
	180.975	104.775	85.725	558	780	774D	10.63
	190.500	127.000	101.600	738	861	854DC	14.75
	190.500	127.000	104.775	860	HH221449	HH221410DC	15.47
	190.500	127.000	104.775	860	HH221449	HH221410D	15.47
	200.025	115.888	80.216	655	98400	98789DC	14.67
	200.025	115.888	80.216	655	98400	98789D	14.67
	212.725	142.875	117.475	922	941	932CD	22.54
	212.725	142.875	117.475	1100	HH224335	HH224310CD	22.75
	214.312	115.888	84.138	758	H924033	H924010D	19.23
104.775	180.000	104.775	85.725	558	782	773D	10.26
	180.000	104.775	85.725	558	786	773D	10.02
	180.000	104.775	85.725	558	787	773D	10.16
	180.975	104.775	85.725	558	782	774DC	10.51
	180.975	104.775	85.725	558	782	774D	10.20
	180.975	104.775	85.725	558	786	774DC	10.44
	190.500	106.362	80.962	586	71412	71751D	12.40
106.362	165.100	82.550	63.500	365	56418	56650D	5.95
107.950	146.050	49.212	39.688	155	L521949	L521910DC	2.20
	146.050	49.212	39.688	155	L521949	L521910D	2.20
	158.750	53.978	39.688	186	37425	37626D	3.21
	159.987	74.612	58.738	310	LM522546	LM522510D	5.07
	165.100	82.550	63.500	365	56425	56650D	5.80
	190.500	106.362	80.962	586	71425	71751DC	11.87
	190.500	106.362	80.962	586	71425	71751D	11.87
	212.725	142.875	117.475	922	936	932CD	21.49
	212.725	142.875	117.475	1100	HH224340	HH224310CD	21.55
109.538	158.750	53.978	39.688	186	37431	37626DC	3.13
	158.750	53.978	39.688	186	37431	37626D	3.13
109.952	190.500	106.362	80.962	586	71432	71751D	12.02
110.000	214.312	115.888	84.138	758	H924043	H924010D	17.81
109.987	159.987	74.612	58.738	316	LM522548	LM522510D	4.72
	159.987	74.612	58.738	316	LM522549	LM522510D	4.87
109.992	177.800	92.075	69.850	443	64433	64700DC	8.31
110.000	212.725	142.875	117.475	922	942	932CD	21.09

Taper Roller Bearing(Inch)

d111.125 - 127.000mm

TDO - Double Outer Race

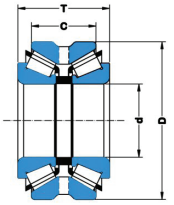


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
111.125	190.500	106.362	80.962	586	71437	71751D	11.50
	214.312	115.888	84.138	758	H924045	H924010D	17.78
	241.300	158.750	107.950	1080	HH924349	HH924310D	30.71
114.300	152.400	47.625	38.100	161	L623149	L623110D	2.16
	177.800	92.075	69.850	443	64450	64700D	7.82
	177.800	92.075	69.850	443	64450	64700D	7.81
	190.500	106.362	80.962	586	71450	71751DC	11.08
	190.500	106.362	80.962	586	71450	71751D	11.08
	212.725	142.875	117.475	922	938	932CD	20.24
	212.725	142.875	117.475	1100	HH224346	HH224310CD	20.38
	228.600	115.888	84.138	798	HM926740	HM926710D	20.75
114.975	177.800	92.075	69.850	443	64452A	64700D	7.54
	212.725	142.875	117.475	1100	HH224349	HH224310CD	20.26
115.087	190.500	106.362	80.962	586	71453	71751D	10.91
119.062	194.873	125.255	131.351	662	HM124646	HM124616XD	14.54
	195.262	136.779	142.875	662	HM124646	HM124618XD	15.17
119.957	194.873	125.255	131.351	662	HM124649	HM124616XD	14.14
	195.262	136.779	142.875	662	HM124649	HM124618XD	15.00
119.964	215.900	106.362	80.962	616	74472	74851CD	15.93
119.975	174.625	77.788	61.912	394	M224748	M224710DC	5.72
	174.625	77.788	61.912	394	M224748	M224710D	5.72
120.650	161.925	63.500	53.975	170	L624549	L624514D	3.22
	169.975	58.738	49.212	230	L225842	L225812D	3.92
	174.625	77.788	61.912	394	M224749	M224710D	5.64
	182.562	85.728	73.025	432	48282	48220DC	7.88
	182.562	85.728	73.025	432	48282	48220D	7.88
	206.375	107.950	82.550	610	795	792CD	13.68
	234.950	142.875	114.300	1010	95475	95927CD	26.72
123.825	182.562	85.728	73.025	432	48286	48220DC	7.59
	182.562	85.728	73.025	432	48286	48220D	7.59
124.943	234.950	142.875	114.300	1010	95491	95927CD	25.64
125.298	228.600	115.888	84.138	798	HM926745	HM926710D	18.84
126.987	207.962	146.304	152.400	717	HM1247440	HM127415XD	17.67
127.000	169.975	58.738	49.212	230	L225849	L225812D	3.46
	182.562	85.728	73.025	432	48290	48220DC	7.12
	182.562	85.728	73.025	432	48290	48220D	7.12
	196.850	101.600	85.725	593	67388	67322DC	10.65

Taper Roller Bearing(Inch)

d127.000 - 139.700mm

TDO - Double Outer Race

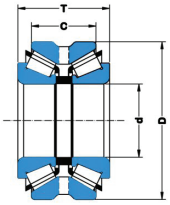


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
127.000	196.850	101.600	85.725	593	67388	67322D	10.65
	200.025	101.600	85.725	593	67388	67325D	11.72
	215.900	106.362	80.962	616	74500	74851CD	14.89
	228.600	115.888	84.138	606	97500	97901D	17.45
	228.600	115.888	84.138	798	HM926747	HM926710DC	18.59
	228.600	115.888	84.138	798	HM926747	HM926710D	18.59
	234.950	142.875	114.300	1010	95900	95927CD	25.49
127.792	228.600	115.888	84.138	798	HM926749	HM926710D	18.47
128.588	206.375	107.950	82.550	610	799	792CD	12.42
129.967	229.873	150.002	160.000	816	H127747	H127715D	26.62
	229.873	150.043	160.000	914	H127746	H127715AD	26.51
	229.873	150.043	160.000	816	H127747	H127715AD	26.02
129.975	234.950	142.875	114.300	1010	95512	95927CD	24.71
130.000	206.375	107.950	82.550	610	797	792CD	12.12
130.175	196.850	101.600	85.725	593	67389	67322DC	10.16
	196.850	101.600	85.725	593	67389	67322D	10.16
	200.025	101.600	85 725	593	67389	67325D	11.23
	206.375	107.950	82.550	610	799A	792CD	12.15
131.750	207.962	146.304	152.400	717	HM127446	HM127415XD	16.80
133.350	177.008	57.150	47.625	237	L327249	L327210D	3.66
	190.500	85.725	73.025	456	48385	48320DC	7.46
	190.500	85.725	73.025	456	48385	48320D	7.46
	196.850	101.600	85.725	593	67390	67322DC	9.66
	196.850	101.600	85.725	593	67390	67322D	9.66
	196.850	101.600	85.725	593	67391	67322D	9.63
	200.025	101.600	85 725	593	67390	67325D	10.72
	215.900	106.362	80.962	616	74525	74851CD	13.91
	234.950	142.875	114.300	1010	95525	95927CD	23.61
	234.950	142.875	114.300	1010	95528	955927CD	23.85
136.525	190.500	85.725	73.025	456	48393	48320DC	7.01
	190.500	85.725	73.025	456	48393	48320D	7.01
	215.900	106.362	80.962	616	74537	74851CD	13.28
	228.600	123.825	98.425	839	896	892CD	18.81
	254.000	149.225	111.125	1060	99537	99102CD	30.70
	254.000	152.400	114.300	1060	99537	99101D	32.18
139.700	215.900	106.362	80.962	616	74550	74851CD	12.81
	215.900	106.362	80.962	616	74550A	74851CD	12.79

Taper Roller Bearing(Inch)

d139.700 - 152.400mm

TDO - Double Outer Race

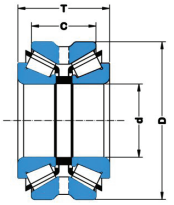


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
139.700	222.250	75.700	53.975	398	73551	73876CD	9.36
	228.600	123.825	98.425	839	898	892CD	18.09
	228.600	123.825	98.425	839	898A	892CD	17.99
	236.538	131.762	106.362	962	HM231132	HM231111CD	21.68
	241.300	131.762	106.362	962	HM231132	HM231116D	22.53
	254.000	149.225	111.125	1060	99550	99102CD	30.10
	254.000	152.400	114.300	1060	99550	99101D	31.24
	307.975	200.025	155.575	1970	HH234031	HH234011CD	65.45
	307.975	200.025	155.575	1970	HH234032	HH234011CD	62.85
142.875	193.675	65.085	53.975	317	36686	36620D	5.27
	200.025	87.315	73.025	462	48684	48620D	7.76
	200.025	87.315	73.025	462	48685	48620DC	7.94
	200.025	87.315	73.025	462	48685	48620D	7.94
	222.250	75.700	53.975	398	73562	73876CD	8.95
	241.300	131.762	106.362	962	HM231136	HM231116D	22.53
144.450	220.662	155.839	163.510	751	HM129848	HM129814XD	19.07
146.050	193.675	65.085	53.975	317	36690	36620DC	4.94
	193.675	65.085	53.975	317	36690	36620D	4.93
	236.538	131.762	106.362	962	HM231140	HM231111CD	20.26
	241.300	131.762	106.362	830	82576	82963CD	21.82
	241.300	131.762	106.362	962	HM231140	HM2311116D	21.83
	244.475	107.950	79.375	648	81575	81963CD	17.51
	254.000	149.225	111.125	1060	99575	99102CD	28.51
	254.000	152.400	114.300	1060	99575	99101D	29.64
	268.288	160.338	125.412	1260	EE107057	107105CD	36.36
	304.800	135.733	97.633	1250	EE750576	751204D	38.56
149.225	236.538	131.762	106.362	962	HM231148	HM231111CD	19.50
	236.538	131.762	106.362	962	HM231149	HM231111CD	19.61
	241.300	131.762	106.362	962	HM231149	HM231116D	21.17
	254.000	149.225	111.125	1060	99587	99102CD	27.83
	254.000	152.400	114.300	1060	99587	99101D	28.18
149.967	249.872	153.764	160.000	1020	HM133436	HM133413XD	30.05
150.000	244.475	107.950	79.375	648	81590	81963CD	16.87
150.812	244.475	107.950	79.375	648	81593	81963CD	16.69
152.400	203.200	92.075	79.375	457	LM330448	LM330410D	7.60
	244.475	107.950	79.375	648	81600	81963CD	16.88
	254.000	149.225	111.125	1060	99600	99102CD	26.93

Taper Roller Bearing(Inch)

d152.400 - 187.325mm

TDO - Double Outer Race

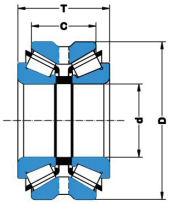


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
152.400	254.000	152.400	114.300	1060	99600	99101D	28.13
	268.288	160.338	125.412	1260	EE107060	107105CD	34.63
	307.975	200.025	146.050	1700	EE450601	451215CD	59.88
	307.975	200.025	155.575	1970	HH234048	HH234011CD	60.93
	307.975	200.025	155.575	1970	HH234049	HH234011CD	58.33
158.750	225.425	85.725	69.850	489	46780	46720CD	10.71
159.951	244.475	107.950	79.375	648	81629	81963CD	14.91
	244.475	107.950	79.375	648	81630	81963CD	15.09
160.325	288.925	142.875	111.125	1330	HM237532	HM237510CD	36.92
165.087	276.225	181.023	185.725	1180	HM136940	HM136916XD	40.98
165.100	215.900	58.740	47.625	288	L433749	L433710D	5.11
	225.425	85.725	69.850	489	46790	46720CD	9.69
	247.650	103.188	84.138	653	67780	67720CD	17.18
	288.925	142.875	111.125	1060	94649	94114CD	36.66
	288.925	142.875	111.125	1330	HM237535	HM237510CD	35.86
	288.925	142.875	111.125	1330	HM237536	HM237510CD	35.83
	298.450	142.875	111.125	1060	94649	94118D	41.10
166.687	225.425	85.725	69.850	489	46792	46720CD	9.39
168.275	247.650	103.188	84.138	653	67782	67720CD	16.39
170.000	254.000	101.600	76.200	763	M235149	M235113CD	15.37
174.625	247.650	103.188	84.138	653	67786	67720CD	14.89
	247.650	103.188	84.138	653	67787	67720CD	15.11
	288.925	142.875	111.125	1060	94687	94114CD	34.02
	288.925	142.875	111.125	1330	HM237542	HM237510CD	33.15
177.787	276.225	181.023	185.725	1180	HM136948	HM136916XD	36.99
177.800	227.012	66.672	52.388	337	36990	36920CD	6.14
177.800	247.650	103.188	84.138	653	67790	67720CD	14.41
	288.925	142.875	111.125	1060	94700	94114CD	32.98
	288.925	142.875	111.125	1330	HM237545	HM237510CD	32.16
	298.450	142.875	111.125	1060	94700	94118D	36.71
	320.675	185.738	138.112	1790	H239640	H239612CD	56.99
179.975	317.500	146.050	111.125	1180	93708	93127CD	47.28
184.150	266.700	103.188	84.138	671	67883	67820CD	18.17
187.325	266.700	103.188	84.138	671	67884	67820CD	17.45
	269.875	119.062	93.663	884	M238849	M238810CD	20.36
	282.575	107.950	79.375	692	87737	87112D	20.89
	320.675	185.738	138.112	1790	H239649	H239612CD	52.92

Taper Roller Bearing(Inch)

d190.500 - 225.425mm

TDO - Double Outer Race

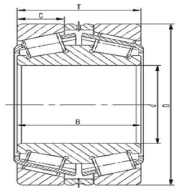


Dimensions, mm				Load Ratings, kN	Part Number		Weight
d	D	T	B	Dynamic C	Inner	Outer	Kg
190.500	266.700	103.188	84.138	671	67885	67820CD	16.69
	282.575	107.950	79.375	692	87750	87112DC	20.68
	282.575	107.950	79.375	692	87750	87112D	20.16
	317.500	146.050	111.125	1180	93750	93127CD	43.76
	368.300	193.675	136.525	1880	EE420751	421451CD	84.09
192.088	266.700	103.188	84.138	671	67887	67820CD	15.89
193.675	282.575	107.950	79.375	692	87762	87112DC	19.88
	282.575	107.950	79.375	692	87762	87112D	19.36
196.850	254.000	61.910	47.625	340	L540049	L540010D	7.12
	257.175	85.725	66.675	513	LM739749	LM739710CD	11.08
	317.500	146.050	111.125	1180	93775	93127CD	41.54
200.025	292.100	125.415	101.600	1020	M241543	M241510CD	26.09
	317.500	146.050	111.125	1180	93787	93127CD	40.58
	384.175	238.125	193.675	2860	H247535	H247510CD	123.53
203.200	276.225	90.485	73.025	707	LM241149	LM241110D	14.52
	282.575	101.600	82.550	684	67983	67920CD	18.66
	292.100	109.538	84.138	914	M541349	M541310CD	21.43
203.200	292.100	125.415	101.600	1020	M241547	M241510CD	25.12
	301.625	125.453	140.005	1020	M241547C	M241513D	31.06
	301.625	125.453	140.005	1020	M241547	M241513XD	31.73
	317.500	127.000	88.900	901	EE132083	132126D	34.36
	317.500	146.050	111.125	1180	93800	93127CD	39.58
	368.300	193.675	136.525	1880	EE420801	421451CD	78.57
204.788	292.100	125.415	101.600	1020	M241549	M241510CD	24.60
206.375	282.575	101.600	82.550	684	67985	67920CD	17.87
	317.500	127.000	83.900	901	EE132084	132126D	33.32
	336.550	211.138	169.862	2180	H242649	H242610CD	68.90
209.550	282.575	101.600	82.550	684	67989	67920CD	17.21
	317.500	146.050	111.125	1180	93825	93127CD	37.26
	317.500	146.050	111.125	1180	93825A	93127CD	36.49
	355.600	152.400	111.125	1220	96825	96140CD	57.19
212.725	285.750	98.425	76.200	693	LM42745	LM742710CD	16.55
215.900	285.750	98.425	76.200	646	LM742748	LM742710CD	15.50
	285.750	98.425	76.200	693	LM742749	LM742710CD	15.74
	406.400	195.262	147.638	2510	EE820085	820161CD	102.16
220.663	314.325	131.762	106.362	1190	M244249	M244210CD	31.22
225.425	400.050	187.325	136.525	1920	EE430888	431576CD	90.91

Taper Roller Bearing(Inch)

d31.750 - 136.525mm

TDI - Double Inner Race

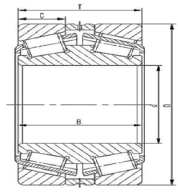


Dimensions, mm				Load Ratings kN	Part Number		Bearing Weight kg
d	D	T	B	Dynamic(1) C1	Inner	Outer	
31.750	69.012	39.705	39.182	951	14126D	14276	0.71
42.862	80.962	34.925	31.750	885	13169D	13318	0.77
44.450	80.962	34.925	31.750	885	13176D	13318	0.74
46.037	80.962	34.925	31.750	885	13182D	13318	0.73
50.800	93.264	50.013	53.188	153	375D	374	1.40
50.800	96.838	53.188	53.188	153	375D	372A	1.61
55.562	96.838	51.298	53.188	158	389DE	382A	2.05
63.500	112.712	60.325	60.325	291	39585D	39520	2.59
63.500	136.525	66.091	65.989	298	78251D	78537	4.59
63.500	140.030	66.090	65.989	298	78251D	78551	4.83
64.987	136.525	66.091	65.989	298	78255D	78537	4.55
64.987	140.030	66.091	65.989	298	78255D	78551	4.91
80.962	133.350	60.325	59.538	269	496D	492A	3.25
80.962	136.525	60.325	59.538	269	496D	493	3.53
80.962	139.992	80.962	80.134	360	581D	572	5.31
85.725	123.825	41.278	44.450	161	L217845D	L217810	1.74
85.725	127.000	41.278	44.450	161	L217845D	L217813	1.93
88.900	161.925	101.549	107.950	570	767D	752	8.77
92.075	148.430	57.150	57.942	284	42362D	42584	3.87
95.250	136.525	57.150	57.150	243	LM119348D	LM119311	2.68
98.425	180.975	101.600	102.362	603	779D	772	11.33
101.600	157.162	80.167	79.375	389	52400D	52618	5.29
101.600	161.925	86.518	79.375	389	52400D	52638	6.28
104.775	180.975	101.600	102.362	603	782D	772	10.68
107.950	212.725	142.875	152.400	996	946D	932	22.94
114.300	190.500	98.425	101.600	633	71450D	71750	11.01
114.300	212.725	142.875	152.400	1180	HH224346DD	HH224310	22.01
120.650	174.625	66.678	68.262	426	M224749D	M224710	5.82
127.000	196.850	92.075	92.075	640	67388D	67322	10.66
127.000	228.600	160.338	151.244	655	97500D	97900	24.49
127.000	234.950	139.700	152.400	1090	95499D	95925	25.95
130.005	215.900	123.825	123.825	665	74510D	74850	17.45
130.175	215.900	101.600	101.600	665	74512D	74850	14.97
133.350	196.850	92.075	92.075	640	67390D	67322	9.73
136.525	225.425	120.650	120.650	1130	H228649D	H228610	19.97

Taper Roller Bearing(Inch)

d139.700 - 228.600mm

TDI - Double Inner Race

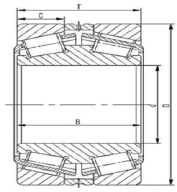


Dimensions, mm				Load Ratings kN	Part Number		Bearing Weight kg
d	D	T	B	Dynamic(1) C1	Inner	Outer	
139.700	200.025	77.788	75.408	499	48680D	48620	8.13
149.225	236.538	106.362	105.346	897	82587D	82931	17.47
149.225	241.300	106.362	105.346	897	82587D	82950	19.08
149.225	254.000	120.650	120.650	1150	99587D	99100	25.95
152.400	244.475	87.312	92.075	699	81601D	81962	14.96
155.575	247.650	122.238	122.238	1100	H432549D	H432510	23.18
165.100	225.425	79.375	76.200	528	46790D	46720	9.45
174.625	288.925	123.825	123.825	1430	HM237542D	HM237510	31.85
177.800	247.650	90.488	90.488	705	67790D	67720	13.30
177.800	279.400	112.710	112.712	930	82680D	82620	25.80
177.800	288.925	123.825	123.825	1150	94706D	94113	32.59
177.800	288.925	123.825	123.825	1430	HM237546D	HM237510	31.80
177.800	304.800	109.438	114.300	1050	EE280700D	281200	31.90
187.325	319.964	168.275	161.925	1830	H239649D	H239610	52.73
187.325	320.675	168.275	161.925	1830	H239649D	H239612	53.29
190.500	317.500	133.350	133.350	1270	93751D	93125	41.89
190.500	368.300	158.750	152.400	1920	EE420750D	421450	76.87
199.975	317.500	133.350	133.350	1270	93788D	93125	40.08
203.200	317.500	123.825	123.825	1270	93800D	93125	42.54
203.200	317.500	133.350	133.350	1270	93801D	93125	37.25
203.200	317.500	142.875	133.350	1270	93801D	93126	38.99
203.200	365.049	158.750	152.400	1920	EE420800D	421437	70.53
203.275	368.300	158.750	152.400	1920	EE420804D	421450	71.12
206.375	282.575	87.313	87.312	738	67985D	67920	16.43
206.375	336.550	180.975	184.150	2360	H242649D	H242610	65.06
215.900	285.750	85.725	85.725	748	LM742749D	LM742710	15.15
215.900	288.925	85.725	85.725	748	LM742749D	LM742714	15.88
215.900	355.600	120.650	120.650	1390	EE130850D	131400	46.68
215.900	355.600	127.000	130.175	1320	96851D	96140	51.05
219.075	358.775	196.850	200.025	2520	H244849D	H244810	81.11
220.662	314.325	115.888	115.888	1210	M244249D	M244210	29.07
225.425	355.600	120.650	120.650	1390	EE130887D	131400	43.70
225.425	355.600	165.100	165.100	1390	EE130888D	131400	52.19
228.600	355.600	120.650	120.650	1390	EE130900D	131400	43.45
228.600	355.600	165.100	165.100	1390	EE130903D	131400	50.40

Taper Roller Bearing(Inch)

d228.600 - 276.225mm

TDI - Double Inner Race

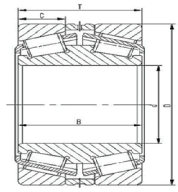


Dimensions, mm				Load Ratings kN	Part Number		Bearing Weight kg
d	D	T	B	Dynamic(1) C1	Inner	Outer	
228.600	400.050	158.750	161.925	1960	EE430901D	431575	81.54
228.600	425.450	177.800	165.100	2700	EE700090D	700167	106.49
228.600	431.800	158.749	158.750	2220	EE113090D	113170	102.14
234.950	327.025	93.662	93.662	918	8576D	8520	24.86
234.950	384.175	209.550	209.550	3090	H247549D	H247510	98.04
241.225	355.498	107.950	107.950	1150	EE127094D	127138	36.78
241.300	419.100	177.800	174.625	2650	EE821096D	821165	101.84
241.478	349.148	107.950	107.950	1150	EE127097D	127135	33.77
241.478	355.498	107.950	107.950	1150	EE127097D	127138	35.08
241.478	355.600	107.950	107.950	1150	EE127097D	127140	35.12
244.475	327.025	92.075	92.075	987	LM247748D	LM247710	21.53
247.650	406.400	215.900	219.075	3420	HH249949D	HH249910	120.05
254.000	355.600	92.710	92.862	976	EE171000D	171400	27.99
254.000	358.775	130.175	130.175	1590	M249748D	M249710	42.34
254.000	360.000	136.225	130.175	1590	M249748D	JM249712	44.36
254.000	365.049	92.710	92.862	976	EE171000D	171436	30.85
254.000	368.300	92.710	92.862	976	EE171000D	171450	32.05
254.000	422.275	152.400	139.700	2610	HM252343D	HM252310	81.05
254.000	431.724	145.258	139.700	2610	HM252343D	HM252315	82.79
254.000	438.150	165.100	165.100	2470	EE738101D	738172	105.97
254.000	444.500	133.350	133.350	2050	EE822101D	822175	84.48
260.350	365.125	107.950	107.950	1180	EE134102D	134143	33.76
260.350	406.400	155.575	152.400	2040	EE324103D	324160	121.01
260.350	419.100	158.750	155.575	1960	EE435103D	435165	80.70
260.350	422.275	152.400	139.700	2610	HM252347D	HM252310	76.62
260.350	431.724	145.258	139.700	2610	HM252347D	HM252315	79.98
260.350	431.724	148.433	152.400	2610	HM252348D	HM252315	81.35
260.350	444.500	196.850	196.850	2810	EE823103D	823175	119.46
266.700	355.600	107.950	109.538	1400	LM451349D	LM451310	30.19
266.700	393.700	130.175	130.175	1540	EE275106D	275155	49.03
266.700	403.225	122.240	130.175	1540	EE275106D	275158	51.81
266.700	406.400	122.240	130.175	1540	EE275106D	275160	53.51
266.700	488.950	228.600	238.125	4220	EE295106D	295193	184.42
269.875	381.000	136.525	136.525	2000	M252349D	M252310	49.93
276.225	381.000	95.250	88.900	806	89108D	89148	29.21

Taper Roller Bearing(Inch)

d276.2250 - 317.500mm

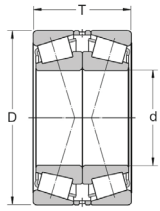
TDI - Double Inner Race



Dimensions, mm				Load Ratings kN	Part Number		Bearing Weight kg
d	D	T	B	Dynamic(1) C1	Inner	Outer	
276.225	381.000	111.125	88.900	806	89108D	89150	32.47
276.225	393.700	130.175	130.175	1540	EE275109D	275155	49.79
276.225	403.225	122.240	130.175	1540	EE275109D	275158	51.43
279.400	457.200	244.475	244.475	4560	HH255149D	HH255110	169.04
279.400	469.900	169.862	166.688	2810	EE722111D	722185	114.93
279.578	380.898	117.475	117.475	1260	LM654644D	LM654610	40.56
279.578	381.000	95.250	88.900	806	89111D	89148	28.21
279.578	381.000	111.125	88.900	806	89111D	89150	31.47
280.000	409.981	206.375	206.375	1610	EE128114D	128161	83.02
288.925	406.400	144.462	144.462	2070	M255449D	M255410	60.77
292.100	422.275	130.175	130.175	1890	EE330116D	330166	61.13
292.100	469.900	138.928	142.875	2630	EE921150D	921850	88.34
292.100	476.250	138.928	142.875	2630	EE921150D	921875	92.56
298.450	438.048	131.762	131.762	1880	EE329118D	329172	64.02
298.450	444.500	111.125	107.950	1540	EE291176D	291750	54.57
299.975	439.948	133.350	134.938	1560	EE129119D	129174	67.14
300.000	460.000	160.000	160.000	2920	NP741064	NP034947	104.21
300.038	422.275	150.812	150.812	2260	HM256849DA	HM256810	67.50
300.038	422.275	150.812	150.812	2260	HM256849D	HM256810	69.57
303.212	495.300	263.525	263.525	5000	HH258249D	HH258210	213.93
304.648	438.048	131.762	131.762	1920	EE329117D	329172	64.30
304.648	438.048	133.350	134.938	1560	EE129121D	129172	60.89
304.648	438.048	138.112	128.588	1910	M757447D	M757410	64.10
304.800	419.100	130.175	130.175	2080	M257149D	M257110	52.61
304.800	444.500	111.125	107.950	1540	EE291200D	291750	52.03
304.800	444.500	111.125	107.950	1540	EE291200D	291749	55.22
304.800	495.300	171.450	165.100	2940	EE724121D	724195	125.31
304.800	501.650	161.925	161.925	3120	HM258949D	HM258910	130.56
304.800	558.800	285.750	285.750	5390	EE790119D	790221	296.99
304.902	412.648	128.588	128.588	1940	M257248D	M257210	50.79
304.902	438.048	196.850	212.725	1560	EE129124D	129172	87.48
305.000	438.048	133.350	134.938	1560	EE129123D	129172	60.71
305.000	559.867	170.434	169.977	2690	HM959649D	HM959618	181.92
305.054	499.948	200.000	200.000	3360	HM858548D	HM858511	152.93

Single row taper roller bearings paired face-to-face

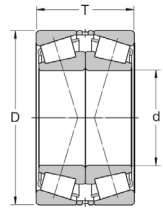
d25 - 90mm



Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	T	Dynamic C	Static C_0	Reference speed	Limiting speed		
mm			kN		r/min		kg	
25	62	36.5	64.4	80	4200	7700	0.55	31305
30	72	41.5	93	100	3920	6650	0.85	31306
35	80	45.5	120	134	3500	5950	1.10	31307
40	90	50.5	146	163	3150	5250	1.50	31308
45	100	54.5	180	204	2800	4690	2.00	31309
50	90	43.5	150	183	3360	5250	1.10	30210
	110	58.5	208	240	2520	4200	2.60	31310
55	90	54	180	270	3150	4900	1.35	33011
	120	63	240	275	2380	3920	3.30	31311
60	95	35	163	245	3010	4690	1.90	32012
	110	48	250	320	2800	4200	2.40	32212
	130	67	285	335	2100	3710	4.10	31312
65	120	49.5	228	270	2520	3920	1.20	30213
	140	72	325	380	1960	3360	5.05	31313
70	110	38	200	305	2660	3920	1.80	32014
	110	51	220	400	2380	3920	2.40	33014
	150	76	365	440	1820	3150	6.15	31314
75	115	62	233	455	2240	3710	2.40	33015
	125	74	303	530	2100	3500	3.80	33115
	130	54.5	238	355	2100	3500	2.85	30215
	130	66.5	275	425	2100	3500	3.40	32215
	160	80	405	490	1680	3010	7.25	31315
80	125	58	233	430	2100	3500	2.65	32016
	140	70.5	319	490	1960	3150	4.25	32216
	170	85	440	530	1680	2800	8.75	31316
85	130	58	238	450	1960	3360	2.80	32017
	130	72	308	620	1960	3360	3.55	33017
	150	61	303	440	1820	3010	4.30	30217
	150	77	369	570	1820	3010	5.45	32217
	150	98	495	850	1680	3010	7.35	33217
	180	89	413	570	1400	2660	10.00	31317
90	140	64	292	540	1820	3010	3.65	32018
	140	78	369	710	1820	3150	4.50	33018
	160	65	336	490	1680	2800	5.15	30218
	160	85	429	680	1680	2800	6.90	32218
	190	93	457	630	1330	2380	11.50	31318

Single row taper roller bearings paired face-to-face

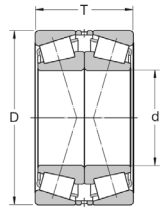
d95 - 160mm



Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	T	Dynamic C	Static C_0	Reference speed	Limiting speed		
mm			kN		r/min		kg	
95	145	78	380	735	1820	3010	5.00	33019
	170	91	484	780	1540	2660	8.45	32219
	200	99	501	710	1260	2380	13.0	31319
100	150	64	292	560	1680	2800	3.95	32020
	180	74	418	640	1540	2520	7.60	30220
	180	98	539	880	1540	2520	10.00	32220
	215	103	693	980	1330	2240	16.50	30320
	215	113	644	930	1190	2100	18.00	31320
105	160	70	347	670	1540	2660	5.00	32021
110	170	76	402	780	1540	2520	6.30	32022
	180	112	627	1250	1400	2380	11.50	33122
	200	82	523	800	1400	2380	10.50	30222
	200	112	682	1140	1330	2240	14.50	32222
	240	126	781	1160	1050	1960	26.00	31322
120	180	76	418	830	1400	2380	6.75	32024
	180	96	495	1080	1400	2380	8.65	33024
	215	87	583	915	1260	2100	13.00	30224
	215	123	792	1400	1260	2100	18.50	32224
	260	119	968	1400	1120	1820	29.50	30324
	260	136	935	1400	980	1680	33.50	31324
130	180	64	341	735	1400	2520	4.95	32926
	200	90	539	1080	1260	2100	10.0	32026
	230	87.5	627	980	1190	1960	14.5	30226
	230	135.5	952	1660	1120	1960	23.0	32226
	280	144	1050	1560	910	1680	40.0	31326
140	210	90	561	1160	1190	1960	11.0	32028
	250	91.5	721	1140	1050	1820	18.0	30228
	250	143.5	1100	2000	1050	1820	29.5	32228
	300	154	1190	1800	840	1540	52.5	31328
150	225	96	644	1320	1120	1820	13.5	32030
	270	98	737	1120	980	1680	22.5	30230
	270	154	1250	2280	980	1680	37.5	32230
	320	164	1340	2040	770	1400	58.5	31330
160	240	102	737	1560	1050	1680	16.0	32032
	290	104	913	1460	910	1540	27.5	30232
	290	168	1510	2800	910	1540	48.0	32232

Single row taper roller bearings paired face-to-face

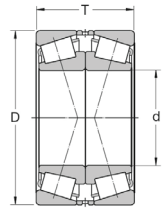
d170 - 220mm



Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	T	Dynamic C	Static C_0	Reference speed	Limiting speed		
mm			kN		r/min		kg	
170	230	76	484	1160	1050	1960	9.2	32934
	260	114	880	1830	980	1540	22.0	32034
	310	182	1720	3250	840	1400	59.0	32234
180	250	90	605	1460	980	1820	14.0	32936
	280	128	1100	2320	910	1400	29.5	32036
	320	114	1010	1630	840	1400	42.0	30236
	320	182	1720	3250	770	1330	61.0	32236
190	260	90	616	1530	910	1680	14.5	32938
	290	128	1120	2400	840	1400	30.5	32038
	340	120	1230	2000	770	1260	50.0	30238
200	310	140	1280	2750	770	1330	39.0	32040
	360	128	1340	2240	700	1190	52.0	30240
	360	208	2090	4000	700	1190	88.0	32240
220	300	102	842	2000	770	1400	21.0	32944
	340	152	1540	3350	700	1190	51.0	32044

Single row taper roller bearings paired back-to-back

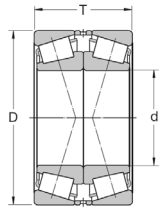
d40 - 220mm



Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	T	Dynamic C	Static C_0	Reference speed	Limiting speed		
mm			kN		r/min		kg	
40	90	72	170	190	3710	5600	1.90	30308T72
75	130	70	238	355	2100	3500	3.25	30215T70
	130	80	275	425	2100	3500	6.80	32215T80
80	140	78	319	490	1960	3150	4.45	32216T78
85	130	66	238	450	1960	3360	2.70	32017T66
	130	70	308	620	1960	3360	3.50	33017T70
	150	71	303	440	1820	3010	4.10	30217T71
90	190	103	457	630	1330	2380	12.50	31318T103
100	180	108	539	880	1540	2520	10.50	32220T108
	180	140	539	880	1540	2520	12.50	32220T140
110	170	84	402	780	1540	2520	6.50	32022T84
120	180	84	418	830	1400	2380	7.00	32024T84
	215	146	792	1400	1260	2100	21.00	32224T146
	260	146	935	1400	980	1680	35.0	31324T146
130	230	97.5	627	980	1190	1960	15.00	30226T975
	280	142	1080	1600	980	1680	36.50	30326T142
140	210	130	561	1160	1190	1960	12.70	32028T130
	250	106	721	1140	1050	1820	19.50	30228T106
	250	158	1100	2000	1050	1820	31.00	32228T158
150	270	168	1250	2280	980	1680	38.00	32230T168
	270	248	1250	2280	980	1680	39.50	32230T248
	320	179	1340	2040	770	1400	58.50	31330T179
160	290	179	1510	2800	910	1540	52.50	32232T179
170	260	162	880	1830	980	1540	30.50	32034T162
180	250	135	605	1460	980	1820	14.5	32936T135
	280	150	1100	2320	910	1540	29.5	32036T150
	280	150	1100	2320	910	1540	29.5	32036T150
	320	196	1720	3250	770	1330	61.5	32236T196
190	260	102	616	1530	910	1680	15	32938T102
	260	122	616	1530	910	1680	15.5	32938T122
	290	146	1120	2400	840	1400	31.5	32038T146
	290	146	1120	2400	840	1400	31.5	32038T146
	290	183	1120	2400	840	1400	32.5	32038T183
200	310	154.5	1280	2750	770	1330	39.5	32040T154.5
220	340	165	1540	3550	700	1190	52	32044T165
	340	165	1540	3550	700	1190	52	32044T165

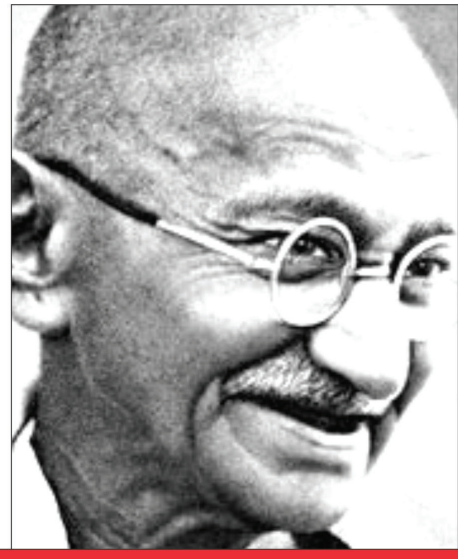
Single row taper roller bearings paired back-to-back

d220 - 260mm



Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	T	Dynamic C	Static C_0	Reference speed	Limiting speed		
mm			kN		r/min		kg	
220	340	165	1540	3550	700	1190	52	32044T165
	340	168	1540	3550	700	1190	52	32044T168
240	360	172	1570	3550	665	1120	56	32048T172
	440	284	3300	6550	560	980	180	32248T284
260	400	189	1980	4400	595	980	80.5	32052T189
	400	194	1980	4400	595	980	80.5	32052T194

THE COMMITMENT TO QUALITY...
THE COMMITMENT TO GROWTH...
Precision Bearings Pvt. Ltd.



"The difference between what we do and what we are capable of doing would suffice to solve most of the world's problems"

Mahatma Gandhi

Spherical
Roller Bearings

Spherical Roller Bearing

Spherical Roller Bearing

Spherical Roller Bearings consist of two rows of roller with common sphere raceway in outer ring and two inner ring race way inclined at an angle of bearing axis. Most spherical roller bearings has circumferential groove and three lubrication holes in outer ring. These bearings carry high radial load, high axial load acting in both direction.

These bearings are made in cylindrical and taper bore. [K Bore] K Taper1:12 K30 = Taper 1:30 240XX and 241 XX Series have a taper of 1:30, other series have a taper of 1:12
Sleeve : spherical roller bearings with tapered bore can be mounted on smooth or stepped shaft by using adapter sleeve & withdrawal sleeve.

Misalignment
As these bearings are self aligning angular misalignment between inner and outer ring can be accommodate without any effect on bearing performance. The permissible misalignment of spherical roller bearing varies depending on the size and load but It Is Approximately 0.018 to 0.045 radian (1° to 2.5°) with normal load. The Limiting speed Is adjusted depending on the bearing load Conditions. Also higher speeds are adjustable by making changes in the lubrication method. Cage Design etc.

Series Available

For Single Row 202XX , 203XX

Spherical Roller Bearings have two rows and roller with a common sphered raceway In the outer ring and two Inner ring raceway inclined at an angle to the bearing axis. They are self aligning and consequently insensitive to misalignment of the shaft with respect to housing and to shaft bonding.

These bearings are designed for high radical load, also accommodate high axial loads acting in both directions. An oil groove and holes are provided in the outer ring to supply lubricant, to use bearings with oil grooves and holes, it is essential to provide an oil groove in the housing bore, since the depth of the groove in the bearing is limited.

Another Feather in ZNL's Research and Development Centers cap, by completely redesigning the Spherical Roller Bearings with the help of advance computer aided design and unique methods of calculations. Tests are carried out on the ZNL test rigs and in the field have confirmed the improved reliability and performance of the design.

ALL W33 Series bearings are manufactured with an oil groove and lubrication holes in the outer rings. Improved features such as cage design, surface finish, stress distribution across the rollers and elimination of the rubbing surfaces lead to: Doubling of expectancy and in some cases trebling for the same space envelope, due to the use of more reliable materials.

This allows smaller bearings to be used when machines are being redesigned. Doubling of static capacity allowing the bearing to perform well In low speed applications under a very heavy load. Higher operating speeds that allow a wider range of application. Better performance under shock loading and vibration is a valuable characteristic in difficult applications.

Spherical Roller Bearing

Radial Internal Clearance of Spherical Roller Bearings with Cylindrical Bore

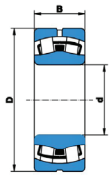
Bore Diameter d		Radial Internal Clearance									
		C2		Normal		C3		C4		C5	
Over	Incl.	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max
mm		Micron									
18	24	10	20	20	35	35	45	45	60	60	**75**
24	30	15	25	25	40	40	55	55	75	75	**95**
30	40	15	30	30	45	45	60	60	80	80	**100**
40	50	20	35	35	55	55	75	75	100	100	**125**
50	65	20	40	40	65	65	90	90	120	120	**150**
65	80	30	50	50	80	80	110	110	145	145	**185**
80	100	35	60	60	100	100	135	135	180	180	**225**
100	120	40	75	75	120	120	160	160	210	210	**260**
120	140	50	95	95	145	145	190	190	240	240	**300**
140	160	60	110	110	170	170	220	220	280	280	**350**
160	180	65	120	120	180	180	240	240	310	310	**390**
180	200	70	130	130	200	200	260	260	340	340	**430**
200	225	80	140	140	220	220	290	290	380	380	**470**
225	250	90	150	150	240	240	320	320	420	420	**520**
250	280	100	170	170	260	260	350	350	460	460	**570**

Radial internal clearance of spherical roller bearings with Taper bore

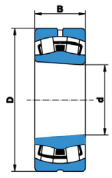
Bore Diameter d		Redial Internal Clearance									
		C2		Normal		C3		C4		C5	
Over	Incl.	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
mm		Micron									
24	30	20	30	30	40	40	55	55	75	-	**-**
30	40	25	35	35	50	50	65	65	85	85	**105**
40	50	30	45	45	60	60	80	80	100	100	**130**
50	65	40	55	55	75	75	95	95	120	120	**160**
65	80	50	70	70	95	95	120	120	150	150	**200**
80	100	55	80	80	110	110	140	140	180	180	**230**
100	120	65	100	100	135	135	170	170	220	220	**280**
120	140	80	120	120	160	160	200	200	260	260	**330**
140	160	90	130	130	180	180	230	230	300	300	**380**
160	180	100	140	140	200	200	260	260	340	340	**430**
180	200	110	160	160	220	220	290	290	370	370	**470**
200	225	120	180	180	250	250	320	320	410	410	**520**
225	250	140	200	2200	270	270	350	350	450	450	**570**
250	280	150	220	220	300	300	390	390	490	490	**620**
280	315	170	240	240	330	330	430	430	540	540	**680**

Spherical Roller Bearing

d20 - 85mm



CYLINDRICAL BORE

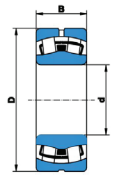


TAPERED BORE

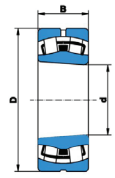
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
20	52	15	30.5	30.5	8000	10000	0.16	21304CCKW33	21304CCW33
25	52	18	35.7	35.7	8500	11000	0.18	22205CCKW33	22205CCW33
	62	17	41.4	41.5	6700	8500	0.25	21305CCKW33	21305CCW33
30	62	20	48.9	52	7500	9500	0.28	22205CCKW33	22205CCW33
	72	19	55.2	61	6000	7500	0.38	21306CCKW33	21306CCW33
35	72	23	67.3	73.5	6300	8000	0.43	22205CCKW33	22205CCW33
	80	21	65.6	72	5300	6700	0.51	21307CCKW33	21307CCW33
40	80	23	73.6	81.5	6000	7500	0.52	22208CCKW33	22208CCW33
	90	23	82.8	98	4500	5600	0.71	21308CCKW33	21308CCW33
	90	33	115	122	4500	5600	1.00	22308CCKW33	22308CCW33
45	85	23	77.1	88	5300	6700	0.56	22209CCKW33	22209CCW33
	100	25	101	114	4300	5300	0.95	21308CCKW33	21308CCW33
	100	36	134	170	4000	5200	1.55	22309CCKW33	22309CCW33
50	90	23	84.5	100	5000	6300	0.60	22210CCKW33	22210CCW33
	110	27	120	140	3600	4800	1.20	21310CCKW33	21310CCW33
	110	40	176	200	3400	4300	1.85	22310CCKW33	22310CCW33
55	100	25	99.5	118	4500	5600	0.82	22211CCKW33	22211CCW33
	120	29	138	163	3400	4300	1.60	21311CCKW33	21311CCW33
	120	43	199	232	3200	4000	2.35	22311CCKW33	22311CCW33
60	110	28	122	146	4000	5000	1.10	22212CCKW33	22212CCW33
	130	31	161	200	3000	3800	1.95	21312CCKW33	21312CCW33
	130	46	235	280	3000	3800	2.95	22312CCKW33	22312CCW33
65	120	31	148	183	3800	4800	1.45	22213CCKW33	22213CCW33
	140	31	184	240	2800	3600	2.45	21313CCKW33	21313CCW33
	140	48	253	300	2600	3400	3.55	22313CCKW33	22313CCW33
70	125	31	148	186	3600	4500	1.55	22214CCKW33	22214CCW33
	150	35	207	260	2600	3400	3.00	21314CCKW33	21314CCW33
	150	51	311	380	2400	3200	4.30	22314CCKW33	22314CCW33
75	130	31	158	208	3400	4300	1.65	22215CCKW33	22215CCW33
	160	37	235	300	2400	3200	3.55	21315CCKW33	21315CCW33
	160	55	345	430	2200	3000	5.25	22315CCKW33	22315CCW33
80	140	33	176	228	3200	4000	2.05	22216CCKW33	22216CCW33
	170	39	258	335	2200	3000	4.20	21316CCKW33	21316CCW33
	170	58	374	455	2000	2800	6.20	22316CCKW33	22316CCW33
85	150	36	210	270	3000	3800	2.55	22217CCKW33	22217CCW33
	180	41	293	375	2000	2800	5.00	21317CCKW33	21317CCW33
	180	60	420	520	1900	2600	7.25	22317CCKW33	22317CCW33

Spherical Roller Bearing

d90 - 130mm



CYLINDRICAL BORE

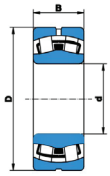


TAPERED BORE

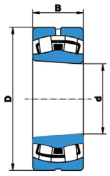
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
90	160	40	253	340	2600	3400	3.40	22218CCKE33	22218CCE33
	160	52.4	311	440	1900	2600	4.60	23218CCKW33	23218CCW33
	190	43	322	425	1900	2600	5.80	21318CCKW33	21318CCW33
	190	64	477	610	1800	2400	8.60	22318CCKW33	22318CCW33
95	170	43	282	375	2400	3200	4.00	22219CCKE33	22219CCE33
	200	45	351	480	1800	2400	7.15	21319CCKW33	21319CCW33
	200	67	518	670	1800	2400	10.0	22319CCKW33	22319CCW33
100	165	52	322	490	2000	2800	4.40	23120CCKE33	23120CCE33
	180	46	311	415	2200	3000	4.85	22220CCKW33	22220CCW33
	180	60.3	414	600	1700	2200	6.70	23220CCKW33	23220CCW33
	215	47	385	530	1700	2200	8.80	21320CCKW33	21320CCW33
	215	73	610	800	1700	2200	13.0	22320CCKW33	22320CCW33
110	170	45	267	440	2200	3000	3.75	23022CCKE33	23022CCE33
	180	56	374	585	1900	2600	5.55	23122CCKW33	23122CCW33
	180	69	460	750	1600	2000	6.85	24122CCKW33	24122CCW33
	200	53	408	560	2000	2800	7.00	22222CCKW33	22222CCW33
	200	69.8	518	765	1600	2000	9.70	23222CCKW33	23222CCW33
	240	50	460	630	1600	2000	12.0	21322CCKW33	21322CCW33
	240	80	725	965	1600	2000	18.0	23222CCKW33	23222CCW33
120	180	46	355	510	2240	2800	4.20	23024 CCK/W33	23024 CC/W33
	180	60	430	670	1400	2380	5.45	24024 CCK/W33	24024 CC/W33
	200	62	510	695	1680	2380	8.00	23124 CCK/W33	23124 CC/W33
	200	80	655	950	1330	1820	10.3	24124 CCK/W33	24124 CC/W33
	215	58	630	765	1960	2660	8.70	22224 EK	22224 E
	215	76	695	930	1400	1960	12.0	23224 CCK/W33	23224 CC/W33
	260	86	965	1120	1400	1820	23.0	22324 CCK/W33	22324 CC/W33
130	200	52	430	610	1960	2520	6.00	23026 CCK/W33	23026 CC/W33
	200	69	540	815	1330	2100	8.05	24026 CCK/W33	24026 CC/W33
	210	64	560	780	1680	2240	8.80	23126 CCK/W33	23126 CC/W33
	210	80	680	1000	1260	1680	11.0	24126 CCK/W33	24126 CC/W33
	230	64	735	930	1820	1820	11.0	22226 EK	22226 E
	230	80	780	1060	1330	1330	14.5	23226 CCK/W33	23226 CC/W33
	280	93	1120	1320	1190	1190	29.0	22326 CCK/W33	22326 CC/W33
140	210	53	468	680	1820	2380	6.55	23028 CCK/W33	23028 CC/W33
	210	69	570	900	1260	1960	8.55	24028 CCK30/W33	24028 CC/W33
	225	68	630	900	1540	1960	10.5	23128 CCK/W33	23128 CC/W33

Spherical Roller Bearing

d140 - 180mm



CYLINDRICAL BORE

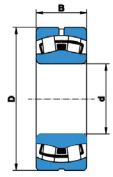


TAPERED BORE

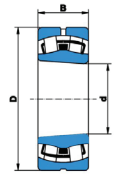
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
140	225	85	673	1160	1050	1680	13.5	24128 CCK30/W33	24128 CC/W33
	250	68	710	900	1680	2240	14.0	22228 CCK/W33	22228 CC/W33
	250	88	915	1250	1120	1680	19.0	23228 CCK30/W33	22328 CC/W33
	300	102	1290	1560	1190	1540	36.5	22328 CCK/W33	22328 CC/W33
150	225	56	510	750	1680	2240	7.95	23030 CCK/W33	23030 CC/W33
	225	75	655	1040	1190	1820	10.5	24030 CCK30/W33	24030 CC/W33
	250	80	830	1200	1400	1820	16.0	23130 CCK/W33	23130 CC/W33
	250	100	1020	1530	980	1540	20.0	24130 CCK30/W33	24130 CC/W33
	270	73	850	1080	1540	210	18.0	22230 CCK/W33	22230 CC/W33
	270	96	1080	1460	1050	1540	24.5	23230 CCK/W33	22330 CC/W33
	320	108	1460	1760	1120	1400	43.5	22330 CCK/W33	22330 CC/W33
160	240	60	585	880	1680	2100	9.70	23032 CCK/W33	23032 CC/W33
	240	80	750	1200	1190	1680	13.0	24032 CCK30/W33	24032 CC/W33
	270	86	980	1370	1190	1680	20.5	23132 CCK/W33	23132 CC/W33
	270	109	1180	1760	980	1330	25.0	24132 CCK30/W33	24132 CC/W33
	290	80	1000	1290	1400	1960	22.5	22232 CCK/W33	22232 CC/W33
	290	104	1220	1660	1050	1540	31.0	23232 CCK/W33	22332 CC/W33
	340	114	1600	1960	1050	1330	52.0	22332 CCK/W33	22332 CC/W33
170	260	67	710	1060	1540	1960	13.0	23034 CCK/W33	23034 CC/W33
	260	90	930	1460	980	1680	17.5	24034 CCK30/W33	24034 CC/W33
	280	88	1040	1500	1260	1680	22.0	23134 CCK/W33	23134 CC/W33
	280	109	1220	1860	910	1330	27.5	24134 CCK30/W33	24134 CC/W33
	310	86	1120	1460	1330	1820	28.5	22234 CCK/W33	22234 CC/W33
	310	110	1400	1930	980	1400	37.5	23234 CCK/W33	22334 CC/W33
	360	120	1760	2160	980	1260	61.0	22334 CCK/W33	22334 CC/W33
180	250	52	431	830	1680	1960	7.90	23936 CCK/W33	23936 CC/W33
	280	74	830	1250	1400	1820	17.0	23036 CCK/W33	23036 CC/W33
	280	100	1080	1730	1050	1540	23.0	24036 CCK30/W33	24036 CC/W33
	300	96	1200	1760	1050	1540	28.0	23136 CCK/W33	23136 CC/W33
	300	118	1400	2160	910	1190	34.5	24136 CCK30/W33	24136 CC/W33
	320	86	1180	1560	1260	1820	29.5	22236 CCK/W33	22236 CC/W33
	320	112	1800	2120	910	1330	39.5	23236 CCK/W33	22336 CC/W33
	380	126	2000	2450	910	1190	71.5	22336 CCK/W33	22336 CC/W33
190	260	52	414	800	1540	1820	8.30	23938 CCK/W33	23938 CC/W33
	290	75	865	1340	1330	1680	18.0	23038 CCK/W33	23038 CC/W33
	290	100	1120	1800	980	1400	24.5	24038 CCK30/W33	24038 CC/W33

Spherical Roller Bearing

d190 - 260mm



CYLINDRICAL BORE

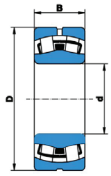


TAPERED BORE

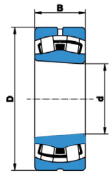
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
190	320	104	1370	2080	1050	1400	35.0	23138 CCK/W33	23138 CC/W33
	320	128	1600	2500	840	1120	43.5	24138 CCK30/W33	24138 CC/W33
	340	92	1270	1700	1190	1680	36.5	22238 CCK/W33	22238 CC/W33
	340	120	1660	2400	910	1260	48.0	23238 CCK/W33	22338 CC/W33
	400	132	2120	2650	840	1260	82.5	22338 CCK/W33	22338 CC/W33
200	280	60	546	1040	1400	1680	11.5	23940 CCK/W33	23940 CC/W33
	310	82	1000	1530	1260	1540	23.3	23040 CCK/W33	23040 CC/W33
	310	109	1290	2120	910	1330	31.0	24040 CCK30/W33	24040 CC/W33
	340	112	1600	2360	1050	1330	43.0	23140 CCK/W33	23140 CC/W33
	340	140	1800	2800	770	1050	53.5	24140 CCK30/W33	24140 CC/W33
	360	98	1460	1930	1120	1540	43.5	22240 CCK/W33	22240 CC/W33
	360	128	1860	2700	840	1190	58.0	23240 CCK/W33	22340 CC/W33
	420	138	2320	2900	840	1050	95.0	22340 CCK/W33	22340 CC/W33
220	300	60	546	1080	1330	1540	12.5	23944 CCK/W33	23944 CC/W33
	340	90	1220	1860	1120	1400	30.5	23044 CCK/W33	23044 CC/W33
	340	118	1500	2600	840	1190	40.0	24044 CCK30/W33	24044 CC/W33
	370	120	1800	2750	910	1190	53.5	23144 CCK/W33	23144 CC/W33
	370	150	2120	3350	700	980	67.0	24144 CCK30/W33	24144 CC/W33
	400	108	1760	2360	1190	1400	60.5	22244 CCK/W33	22244 CC/W33
	400	144	2360	3450	770	1050	81.5	23244 CCK/W33	22344 CC/W33
	460	145	2700	3450	700	980	120	22344 CCK/W33	22344 CC/W33
240	320	60	564	1160	1190	1400	13.5	23948 CCK/W33	23948 CC/W33
	360	92	1290	2080	1050	1330	33.5	23048 CCK/W33	23048 CC/W33
	360	118	1600	2700	770	1120	43.0	24048 CCK30/W33	24048 CC/W33
	400	128	2080	3200	840	1120	66.5	23148 CCK/W33	23148 CC/W33
	400	160	2400	3900	630	910	83.0	24148 CCK30/W33	24148 CC/W33
	440	120	2000	3000	910	1260	83.0	22248 CCK/W33	22248 CC/W33
	440	160	2900	4300	665	910	110	23248 CCK/W33	22348 CC/W33
	500	155	3100	4000	665	910	155	22348 CCK/W33	22348 CC/W33
260	360	75	880	1800	1050	1330	23.5	23952 CCK/W33	23952 CC/W33
	400	104	1600	2550	910	1190	48.5	23052 CCK/W33	23052 CC/W33
	400	140	2040	3450	700	980	65.5	24052 CCK30/W33	24052 CC/W33
	440	144	2550	3900	770	980	90.5	23152 CCK/W33	23152 CC/W33
	440	180	3000	4800	595	840	110	24152 CCK30/W33	24152 CC/W33
	480	130	2650	3550	840	1120	100	22252 CCK/W33	22252 CC/W33
	480	174	3250	4750	595	840	140	23252 CCK/W33	22352 CC/W33
	540	165	3550	4550	595	770	190	22352 CCK/W33	22352 CC/W33

Spherical Roller Bearing

d280 - 340mm



CYLINDRICAL BORE

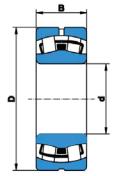


TAPERED BORE

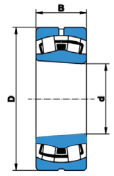
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
280	380	75	845	1760	980	1190	25.0	23956 CCK/W33	23956 CC/W33
	420	106	1750	2850	910	1120	52.5	23056 CCK/W33	23056 CC/W33
	420	140	2160	3800	665	980	69.5	24056 CCK30/W33	24056 CC/W33
	460	146	2650	4250	700	910	97.0	23156 CCK/W33	23156 CC/W33
	460	180	3100	5100	560	770	120	24156 CCK30/W33	24156 CC/W33
	500	130	2700	3750	770	1050	115	22256 CCK/W33	22256 CC/W33
	500	176	3250	4900	560	770	150	23256 CCK/W33	22356 CC/W33
	580	175	4000	5200	560	770	235	22356 CCK/W33	22336 CC/W33
300	380	60	656	1600	630	1260	16.5	23860 CAMA	23860 CAMA
	420	90	1200	2500	910	1120	39.5	23960 CCK/W33	23960 CC/W33
	460	118	2120	3450	840	1050	71.5	23060 CCK/W33	23060 CC/W33
	460	160	2700	4750	595	840	97.0	24060 CCK30/W33	24060 CC/W33
	500	160	3200	5100	665	840	125	23160 CCK/W33	23160 CC/W33
	500	200	3750	6300	490	700	160	24160 CCK30/W33	24160 CC/W33
	540	140	3150	4250	700	980	145	22260 CCK/W33	22260 CC/W33
	540	192	3900	5850	525	700	190	23260 CCK/W33	23260 CC/W33
320	440	90	1430	2700	980	1050	42.0	23964 CCK/W33	23964 CC/W33
	480	121	2240	3800	770	980	78.0	23064 CCK/W33	23064 CC/W33
	480	160	2850	5100	560	840	100	24064 CCK30/W33	24064 CC/W33
	540	176	3750	6000	595	770	165	23164 CCK/W33	23164 CC/W33
	540	218	4250	7100	469	630	210	24164 CCK30/W33	24164 CC/W33
	580	150	3600	4900	665	910	175	22264 CCK/W33	22264 CC/W33
	580	208	4400	6700	490	665	240	23264 CCK/W33	23264 CC/W33
340	460	90	1460	2800	910	980	45.5	23968 CCK/W33	23968 CC/W33
	520	133	2700	4550	700	910	105	23068 CCK/W33	23068 CC/W33
	520	180	3450	6200	525	770	140	24068 CCK30/W33	24068 CC/W33
	580	190	4250	6800	560	700	210	23168 CCK/W33	23168 CC/W33
	580	243	5300	8650	420	595	280	24168 ECCK30J/W33	24168 ECCJ/ W33
	620	224	5100	7800	392	560	295	23268 CCK/W33	23268 CC/W33

Spherical Roller Bearing-Brass Cage

d25 - 85mm



CYLINDRICAL BORE

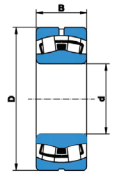


TAPERED BORE

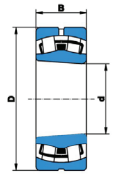
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
25	52	18	35.6	38	7500	10000	0.184	22205 MBKW33	22205 MBW33
25	62	17	45	48	6000	8000	0.270	21305 MBKW33	21305 MBW33
30	62	20	48.5	58	6000	9000	0.295	22206 MBKW33	22206 MBW33
30	72	19	60	66	5800	7200	0.540	21306 MBKW33	21306 MBW33
35	72	23	68.5	82	5000	8000	0.450	22207 MBKW33	22207 MBW33
35	80	21	72	85	4800	6200	0.450	22307 MBKW33	22307 MBW33
40	80	23	71.5	93	4500	7500	0.570	22208 MBKW33	22208 MBW33
40	90	33	106	136	4200	5600	0.930	22308 MBKW33	22308 MBW33
40	90	23	90	108	4000	5200	0.750	21308 MBKW33	21308 MBW33
45	85	23	80.5	95	5300	6700	0.630	22209 MBKW33	22209 MBW33
45	100	36	98.5	121	3800	4800	1.360	22309 MBKW33	22309 MBW33
45	100	25	110	124	4000	5100	0.990	21309 MBKW33	21309 MBW33
50	90	23	78.5	108	5000	6300	0.690	22210 MBKW33	22210 MBW33
50	110	40	162	221	3400	4300	1.810	22310 MBKW33	22310 MBW33
50	110	27	135	155	3300	4500	1.260	21310 MBKW33	21310 MBW33
55	100	25	96	131	4500	5600	0.900	22211 MBKW33	22211 MBW33
55	120	43	189	260	3200	4000	2.41	22311 MBKW33	22311 MBW33
55	120	29	150	172	3000	4000	1.660	21311 MBKW33	21311 MBW33
60	110	28	113	158	4000	5000	1.21	22212 MBKW33	22212 MBW33
60	130	46	212	310	3000	3800	3.00	22312 MBKW33	22312 MBW33
60	130	31	172	215	2700	3500	2.00	21312 MBKW33	21312 MBW33
65	120	31	135	196	3800	4800	1.63	22213 MBKW33	22213 MBW33
65	140	48	243	340	2600	3400	3.98	22313 MBKW33	22313 MBW33
65	140	33	196	260	2600	3400	2.50	21313 MBKW33	21313 MBW33
70	125	31	154	230	3600	4500	1.54	22214 MBKW33	22214 MBW33
70	150	51	300	380	2400	3200	4.50	22314 MBKW33	22314 MBW33
70	150	35	214	276	2400	3260	3.07	21314 MBKW33	21314 MBW33
75	130	31	153	235	3400	4300	1.80	22215 MBKW33	22215 MBW33
75	160	55	325	455	2200	3000	5.45	22315 MBKW33	22315 MBW33
75	160	37	250	325	2200	2900	3.60	21315 MBKW33	21315 MBW33
75	115	40	165	278	1850	2400	1.56	24015 MBKW33	24015 MBW33
80	140	33	171	264	3200	4000	2.30	22216 MBKW33	22216 MBW33
80	170	58	375	550	2000	2800	6.60	22316 MBKW33	22316 MBW33
80	170	39	270	360	2000	2700	4.30	21316 MBKW33	21316 MBW33
85	150	36	202	310	3000	3800	2.93	22217 MBKW33	22217 MBW33
85	180	60	385	555	1900	2600	7.41	22317 MBKW33	22317 MBW33

Spherical Roller Bearing-Brass Cage

d85 - 140mm



CYLINDRICAL BORE

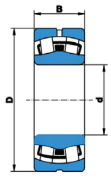


TAPERED BORE

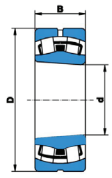
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
85	180	41	320	410	1800	2500	5.20	21317 MBKW33	21317 MBW33
90	160	40	269	375	2600	3400	3.55	22218 MBKW33	22218 MBW33
90	190	64	450	680	1800	2400	8.92	22318 MBKW33	22318 MBW33
90	190	43	350	460	1700	2300	5.95	21318 MBKW33	21318 MBW33
90	160	52.4	300	500	1900	2600	4.66	23218 MBKW33	23218 MBW33
95	170	43	265	410	2400	3200	4.26	22219 MBKW33	22219 MBW33
95	200	67	480	720	1800	2400	10.30	22319 MBKW33	22319 MBW33
100	180	60	410	615	1700	2200	6.95	23220 MBKW33	23220 MBW33
100	180	46	310	485	2200	3000	5.20	22220 MBKW33	22220 MBW33
100	215	73	575	880	1700	2200	13.60	22320 MBKW33	22320 MBW33
100	180	60.3	310	555	2000	2800	4.450	23220 MBKW33	23220 MBW33
100	150	50	267	345	1700	2100	3.07	24020 MBKW33	24020 MBW33
100	165	65	345	640	1100	1600	5.70	24120 MBKW33	24120 MBW33
110	170	45	265	490	2200	3000	3.76	23022 MBKW33	23022 MBW33
110	180	56	355	650	1900	2600	5.80	23122 MBKW33	23122 MBW33
110	200	53	420	685	2000	2800	7.40	22222 MBKW33	22222 MBW33
110	200	69.8	525	810	1600	2000	10.10	23222 MBKW33	23222 MBW33
110	290	80	655	975	1600	2000	18.5	22322 MBKW33	22322 MBW33
110	170	60	365	650	1500	2050	5.11	24022 MBKW33	24022 MBW33
110	180	69	252	790	1000	1400	7.17	24122 MBKW33	24122 MBW33
120	180	46	286	555	2000	2800	4.25	23024 MBKW33	23024 MBW33
120	200	62	430	780	1800	2400	7.78	23124 MBKW33	23124 MBW33
120	215	58	455	750	1900	2600	10.40	22224 MBKW33	22224 MBW33
120	260	86	760	1170	1400	1800	21.60	22324 MBKW33	22324 MBW33
130	200	52	345	640	1900	2600	6.10	23026 MBKW33	23026 MBW33
130	210	64	450	845	1700	2200	9.76	23126 MBKW33	23126 MBW33
130	230	64	510	855	1800	2400	11.5	22226 MBKW33	22226 MBW33
130	200	69	477	815	1300	1800	7.95	24026 MBKW33	24026 MBW33
130	210	80	587	1000	900	1200	11.00	24126 MBKW33	24126 MBW33
130	230	80	690	1060	1400	1800	14.00	23226 MBKW33	23226 MBW33
130	280	93	978	1320	1300	1700	28.50	22326 MBKW33	22326 MBW33
140	210	53	365	715	1800	2400	6.61	23028 MBKW33	23028 MBW33
140	225	68	530	980	1600	2000	10.5	23128 MBKW33	23128 MBW33
140	250	68	595	1010	1700	2200	15.6	22228 MBKW33	22228 MBW33
140	210	69	495	900	1200	1700	8.45	24028 MBKW33	24028 MBW33
140	225	85	673	1160	800	1100	10.50	24128 MBKW33	24128 MBW33

Spherical Roller Bearing-Brass Cage

d140 - 190mm



CYLINDRICAL BORE

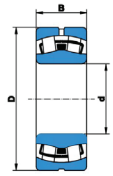


TAPERED BORE

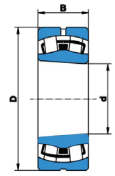
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
140	250	88	800	1250	1200	1600	18.50	23228 MBKW33	23228 MBW33
140	300	102	1130	1560	1100	1500	34.50	22328 MBKW33	22328 MBW33
150	225	56	435	855	1700	2200	8.10	23030 MBKW33	23030 MBW33
150	270	73	700	1190	1600	2000	18.9	22230 MBKW33	22230 MBW33
150	225	75	564	1040	1100	1600	10.50	24030 MBKW33	24030 MBW33
150	250	80	725	1200	1400	1800	16.00	23130 MBKW33	23130 MBW33
150	250	100	900	1530	700	1000	19.80	24130 MBKW33	24130 MBW33
150	270	96	937	1460	1100	1500	24.00	23230 MBKW33	23230 MBW33
150	320	108	1270	1760	1000	1400	41.50	22330 MBKW33	22330 MBW33
160	240	60	506	880	1700	2200	9.70	23032 MBKW33	23032 MBW33
160	240	80	656	1200	1100	1500	13.0	24032 MBKW33	24032 MBW33
160	270	86	845	1370	1300	1700	20.5	23132 MBKW33	23132 MBW33
160	270	109	1040	1760	950	1300	28.0	24132 MBKW33	24132 MBW33
160	290	80	863	1290	1500	1900	22.5	22232 MBKW33	22232 MBW33
160	290	104	1070	1660	1000	1400	30.0	23232 MBKW33	23232 MBW33
160	340	114	1380	1960	950	1300	50.0	22332 MBKW33	22332 MBW33
170	260	67	621	1060	1600	2000	13.0	23034 MBKW33	23034 MBW33
170	260	90	799	1460	1000	1400	17.5	24034 MBKW33	24034 MBW33
170	280	88	897	1500	1200	1600	21.5	23134 MBKW33	23134 MBW33
170	280	109	1070	1880	900	1200	26.5	24134 MBKW33	24134 MBW33
170	310	86	978	1460	1300	1700	28.5	22234 MBKW33	22234 MBW33
170	310	110	1220	1930	950	1300	30.5	23234 MBKW33	23234 MBW33
170	360	120	1540	2160	950	1300	58.5	22334 MBKW33	22334 MBW33
180	250	52	431	830	1700	2200	8.20	23936 MBKW33	23936 MBW33
180	280	74	725	1250	1400	1800	17.0	23036 MBKW33	23036 MBW33
180	280	100	937	1730	950	1300	23.0	24036 MBKW33	24036 MBW33
180	300	96	1050	1760	1100	1500	27.5	23136 MBKW33	23136 MBW33
180	300	118	1220	2160	900	1200	33.5	24136 MBKW33	24136 MBW33
180	320	86	1010	1560	1300	1700	29.5	22236 MBKW33	22236 MBW33
180	320	112	1290	2120	900	1200	39.0	23236 MBKW33	23236 MBW33
180	380	126	1730	2450	900	1200	60.0	22336 MBKW33	22336 MBW33
190	260	52	414	800	1700	2200	8.40	23938 MBKW33	23938 MBW33
190	290	75	753	1340	1300	1700	18.0	23038 MBKW33	23038 MBW33
190	290	100	978	1800	950	1300	24.0	24038 MBKW33	24038 MBW33
190	320	104	1200	2080	1000	1400	34.5	23138 MBKW33	23138 MBW33
190	320	128	1400	2500	850	1100	42.0	24138 MBKW33	24138 MBW33

Spherical Roller Bearing

d190 - 260mm



CYLINDRICAL BORE

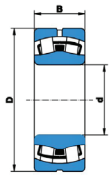


TAPERED BORE

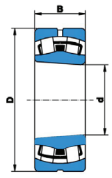
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
190	340	92	1110	1700	1200	1800	36.5	22238 MBKW33	22238 MBW33
190	340	120	1460	2400	850	1100	47.5	23238 MBKW33	23238 MBW33
190	400	132	1870	2650	850	1100	80.0	22338 MBKW33	22338 MBW33
200	280	60	546	1040	1600	2000	11.5	23940 MBKW33	23940 MBW33
200	310	82	880	1530	1200	1600	23.0	23040 MBKW33	23040 MBW33
200	310	109	1130	2120	900	1200	30.5	24040 MBKW33	24040 MBW33
200	340	112	1380	2360	950	1300	42.5	23140 MBKW33	23140 MBW33
200	340	140	1580	2800	800	1000	52.0	24140 MBKW33	24140 MBW33
200	360	98	1270	1930	1100	1500	43.5	22240 MBKW33	22240 MBW33
200	360	128	1610	2700	850	1100	57.0	23240 MBKW33	23240 MBW33
200	420	138	2020	2900	850	1100	92.5	22340 MBKW33	22340 MBW33
220	300	60	546	1080	1500	1900	13.0	23944 MBKW33	23944 MBW33
220	340	90	1050	1860	100	1500	30.5	23044 MBKW33	23044 MBW33
220	340	118	1360	2600	850	1100	53.0	24044 MBKW33	24044 MBW33
220	370	120	1880	2750	900	1200	63.0	23144 MBKW33	23144 MBW33
220	370	150	1840	3350	750	950	69.0	24144 MBKW33	24144 MBW33
220	400	108	1520	2360	950	1300	60.5	22244 MBKW33	22244 MBW33
220	400	144	2070	3450	750	950	79.5	23244 MBKW33	23244 MBW33
220	460	145	2350	3450	750	950	120	22344 MBKW33	22344 MBW33
240	320	60	564	1160	1300	1700	14.0	23948 MBKW33	23948 MBW33
240	360	92	1130	2080	1000	1400	33.5	23048 MBKW33	23048 MBW33
240	360	118	1380	2700	800	1000	42.5	24048 MBKW33	24048 MBW33
240	400	128	1790	3200	850	1100	65.5	23148 MBKW33	23148 MBW33
240	400	160	2100	3900	670	850	80.5	24148 MBKW33	24148 MBW33
240	440	120	1910	3000	900	1200	83.0	22248 MBKW33	22248 MBW33
240	440	160	2530	4300	670	850	110	23248 MBKW33	23248 MBW33
240	500	155	2670	4000	670	850	155	22348 MBKW33	22348 MBW33
260	360	75	880	1800	1100	1500	24.0	23952 MBKW33	23952 MBW33
260	400	104	1400	2550	900	1200	48.5	23052 MBKW33	23052 MBW33
260	400	140	1760	3450	800	900	64.5	24052 MBKW33	24052 MBW33
260	440	180	2220	3900	700	1000	90.5	23152 MBKW33	23152 MBW33
260	440	180	2620	4800	600	750	110	24152 MBKW33	24152 MBW33
260	480	130	2300	3550	850	1100	110	22252 MBKW33	22252 MBW33
260	480	174	2820	4780	630	800	140	23252 MBKW33	23252 MBW33
260	540	165	3050	4550	630	800	190	22352 MBKW33	22352 MBW33

Spherical Roller Bearing

d280 - 360mm



CYLINDRICAL BORE

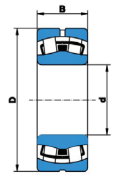


TAPERED BORE

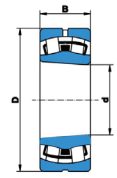
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
280	380	75	845	1760	1000	1400	26.0	23956 MBKW33	23956 MBW33
280	420	106	1520	2850	850	1100	52.5	23056 MBKW33	23056 MBW33
280	420	140	1870	3800	670	850	68.5	24056 MBKW33	24056 MBW33
280	460	146	1870	3800	670	850	68.5	23156 MBKW33	23156 MBW33
280	460	146	2300	4250	750	950	97.0	23156 MBKW33	23156 MBW33
280	460	180	2670	5100	560	700	120	24156 MBKW33	24156 MBW33
280	500	130	2350	3750	800	1000	115	22256 MBKW33	22256 MBW33
280	500	176	2820	4900	600	750	150	23256 MBKW33	23256 MBW33
280	580	175	3450	5200	600	750	235	22356 MBKW33	22356 MBW33
300	420	90	1200	2500	950	1300	40.5	23960 MBKW33	23960 MBW33
300	420	118	1840	3450	800	1000	71.5	23060 MBKW33	23060 MBW33
300	460	160	2350	4750	600	750	97.0	24060 MBKW33	24060 MBW33
300	500	160	2820	5100	670	850	125	23160 MBKW33	23160 MBW33
300	500	200	3280	6300	530	670	160	24160 MBKW33	24160 MBW33
300	540	140	2760	4250	750	950	145	22260 MBKW33	22260 MBW33
300	540	192	3340	5850	530	670	190	23260 MBKW33	23260 MBW33
320	440	90	1240	2700	900	1200	42.0	23964 MBKW33	23964 MBW33
320	480	121	1960	3800	800	1000	78.0	23064 MBKW33	23064 MBW33
320	480	160	2480	5100	560	700	100	24064 MBKW33	24064 MBW33
320	540	176	3280	6000	630	800	165	23164 MBKW33	23164 MBW33
320	540	218	3740	7100	480	600	210	24164 MBKW33	24164 MBW33
320	580	150	3160	4900	670	850	175	22264 MBKW33	22264 MBW33
320	580	208	3850	6700	500	630	240	23264 MBKW33	23264 MBW33
340	460	90	1460	2800	1300	1400	45.5	23968 MBKW33	23968 MBW33
340	520	133	2700	4500	100	1300	105	23068 MBKW33	23068 MBW33
340	520	180	3450	6200	750	1100	140	24068 MBKW33	24068 MBW33
340	580	190	4250	6800	800	1000	210	23168 MBKW33	23168 MBW33
340	580	243	5300	8650	600	850	380	24168 MBKW33	24168 MBW33
340	620	224	5100	7800	560	800	295	23268 MBKW33	23268 MBW33
360	480	90	1400	2750	1200	1300	43.0	23972 MBKW33	23972 MBW33
360	540	134	2750	4800	950	1200	110	23072 MBKW33	23072 MBW33
360	540	180	2550	6550	700	1000	145	24072 MBKW33	24072 MBW33
360	600	192	4300	6950	750	2000	220	23172 MBKW33	23172 MBW33
360	600	243	5600	9300	560	800	270	24172 MBKW33	24172 MBW33
360	650	170	4300	6200	630	850	255	22272 MBKW33	22272 MBW33

Spherical Roller Bearing

d360 - 480mm



CYLINDRICAL BORE

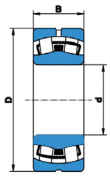


TAPERED BORE

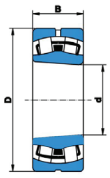
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
360	650	232	5400	8300	530	750	335	23272 MBKW33	23272 MBW33
380	520	106	1960	3800	1100	1200	69.0	23976 MBKW33	23976 MBW33
380	560	135	2900	5000	900	1200	115	23076 MBKW33	23076 MBW33
380	560	180	3600	6800	670	950	150	24076 MBKW33	24076 MBW33
380	620	194	4400	7100	500	1000	230	23176 MBKW33	23176 MBW33
380	620	243	5700	9800	580	850	300	24176 MBKW33	24176 MBW33
380	680	240	5850	9150	500	750	375	23276 MBKW33	23276 MBW33
400	540	106	2000	3900	1100	1200	71.0	23980 MBKW33	23980 MBW33
400	600	148	3250	8700	850	1500	150	23080 MBKW33	23080 MBW33
400	600	200	4300	8100	630	900	205	24080 MBKW33	24080 MBW33
400	650	200	4650	7650	530	950	265	23180 MBKW33	23180 MBW33
400	650	250	6200	10600	430	800	340	24180 MBKW33	24180 MBW33
400	720	256	6550	10400	480	670	450	23280 MBKW33	23280 MBW33
400	820	243	7500	10400	430	750	650	22380 MBKW33	22380 MBW33
420	560	106	2040	4150	1000	1100	74.5	23984 MBKW33	23984 MBW33
420	620	150	3400	6000	600	1100	155	23084 MBKW33	23084 MBW33
420	620	200	4400	8300	530	480	210	24084 MBKW33	24084 MBW33
420	700	224	5600	9300	480	900	350	23184 MBKW33	23184 MBW33
420	700	280	7350	12600	400	750	445	24184 MBKW33	24184 MBW33
420	760	272	7350	1600	450	630	535	23284 MBKW33	23284 MBW33
440	600	118	2450	4900	950	1100	99.5	23988 MBKW33	23988 MBW33
440	650	157	3650	6850	560	1000	180	23088 MBKW33	23088 MBW33
440	650	212	4800	9150	500	850	245	24088 MBKW33	24088 MBW33
440	720	226	6000	10000	450	850	360	23188 MBKW33	23188 MBW33
440	720	280	7500	13200	400	700	460	24188 MBKW33	24188 MBW33
440	790	280	7800	12500	430	600	590	23288 MBKW33	23288 MBW33
460	620	118	1790	4900	560	1100	75.5	23992 MBKW33	23992 MBW33
460	680	163	2500	6000	600	1000	105	23092 MBKW33	23092 MBW33
460	680	218	3900	6950	560	950	205	24092 MBKW33	24092 MBW33
460	680	240	5200	10000	480	800	275	23192 MBKW33	23192 MBW33
460	760	300	6400	101800	430	800	440	24192 MBKW33	24192 MBW33
460	830	296	8300	14800	360	670	560	23292 MBKW33	23292 MBW33
480	600	90	1440	3750	530	1100	61	23896 MBKW33	23896 MBW33
480	650	128	2900	5700	560	1000	125	23096 MBKW33	23096 MBW33
480	700	218	3900	6800	530	950	215	24096 MBKW33	24096 MBW33

Spherical Roller Bearing

d480 - 500mm



CYLINDRICAL BORE

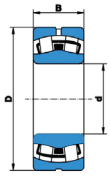


TAPERED BORE

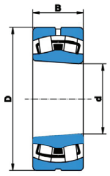
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation	
d mm	D	B	Dynamic C kN	Static C_0	Grease RPM	Oil RPM	Kg	Tapered Bore	Bearing With Cylindrical Bore
480	700	248	5300	10400	450	750	285	23196 MBKW33	23196 MBW33
480	790	308	6750	12000	400	750	485	24196 MBKW33	24196 MBW33
480	790	310	9000	15600	300	630	605	23296 MBKW33	23296 MBW33
500	620	90	1480	4000	530	1000	62	238/500 MBKW33	238/500 MBW33
500	670	128	2900	6000	530	950	130	239/500 MBKW33	239/500 MBW33
500	720	167	4150	7800	500	900	225	230/500 MBKW33	230/500 MBW33
500	720	218	5500	11000	430	700	296	240/500 MBKW33	240/500 MBW33
500	830	264	7650	12900	380	700	580	231/500 MBKW33	231/500 MBW33
500	830	325	9800	17000	320	600	745	241/500 MBKW33	241/500 MBW33
500	920	336	10600	173000	360	500	985	232/500 MBKW33	232/500 MBW33

Spherical Roller Bearing with E-Type Cage

d20 - 85mm



CYLINDRICAL BORE

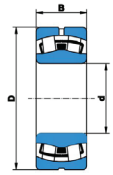


TAPERED BORE

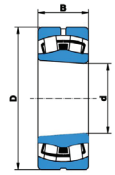
Principal Dimension			Basic Load Ratings		Fatigue Load Limit	Speed Rating	Mass	Designation
			Dynamic	Static				
d	D	B	C	C_0	P_u	Grease		
mm			kN	kN	kN	RPM	Kg	
20	52	15	40.5	33.5	3.7	10500	0.16	21304-EW33
25	52	18	48	42.5	4.8	11900	0.18	22205-EW33
	62	17	52	43	4.75	9100	0.245	21305-EW33
30	62	20	64	57	6.9	9100	0.275	22206-EW33
	72	19	72	63	7	7700	0.386	21306-EW33
35	72	23	88	81.5	9.4	7700	0.434	22207-EW33
	80	21	83	73.5	8.1	6650	0.503	21307-EW33
40	80	23	102	90	11.8	7000	0.528	22208-EW33
	90	23	108	106	14.3	6650	0.701	21308-EW33
	90	33	156	150	13.1	5250	1.05	22308-EW33
45	85	23	104	98	12.7	7000	0.589	22209-EW33
	100	25	129	129	17.3	5950	0.845	21309-EW33
	100	36	186	183	16.1	4690	1.39	22309-EW33
50	90	23	108	106	14.3	6650	0.622	22210-EW33
	110	27	129	129	17.3	5950	1.28	21310-EW33
	110	40	228	224	20.3	4200	1.9	22310-EW33
55	100	25	129	129	17.3	5950	0.851	22211-EW33
	120	43	265	260	23.9	3920	2.27	22311-EW33
60	110	28	170	166	21.2	5250	1.12	22212-EW33
	130	31	212	228	28	4410	1.78	21312-EW33
	130	46	310	310	28	4060	2.89	22312-EW33
65	120	31	200	208	25.5	4690	1.55	22213-EW33
	140	33	250	270	34	3500	2.42	21313-EW33
	140	48	355	365	32.5	3360	3.57	22313-EW33
70	125	31	212	228	28	4410	1.65	22214-EW33
	150	35	250	270	34	3500	3	21314-EW33
	150	51	390	390	36.5	3150	4.21	22314-EW33
75	130	31	216	236	29.5	4410	1.72	22215-EW33
	160	37	305	325	38.5	3360	2.86	21315-EW33
	160	55	440	450	40.5	3010	5.18	22315-EW33
80	140	33	250	270	34	3920	2.13	22216-EW33
	170	39	305	325	38.5	3360	2.65	21316-EW33
	170	58	500	510	45	3010	6.27	22316-EW33
85	150	36	305	325	38.5	3710	2.63	22217-EW33
	180	60	540	560	50	2800	7.06	22317-EW33

Spherical Roller Bearing with E-Type Cage

d90 - 110mm



CYLINDRICAL BORE

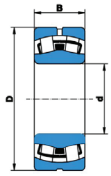


TAPERED BORE

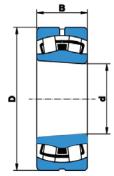
Principal Dimension			Basic Load Ratings		Fatigue Load Limit	Speed Rating	Mass	Designation
			Dynamic	Static				
d	D	B	C	C_0	P_u	Grease		
mm			kN	kN	kN	RPM	Kg	
90	160	40	345	375	42.5	3360	3.43	22218-EW33
	160	52.4	440	520	48.5	3010	4.27	23218-EW33
	190	64	610	630	55	2520	8.51	22318-EW33
95	170	43	380	415	47	3150	4.13	22219-EW33
	200	67	670	695	60	2590	9.69	22319-EW33
100	165	52	450	570	52	3010	4.22	23120-EW33
	180	46	430	490	52	3010	4.96	22220-EW33
	180	60.3	550	655	60	2450	6.32	23220-EW33
	215	47	490	530	61	2520	8.19	21320-EW33
	215	73	815	915	75	2660	13.1	22320-EW33
110	170	45	400	530	52	3010	3.55	23022-EW33
	180	56	530	680	61	2800	5.31	23122-EW33
	200	53	550	600	62	2940	6.99	22222-EW33
	200	69.8	710	865	72	2660	9.18	23222-EW33
	240	80	950	1060	91	2520	17.7	22322-EW33

Spherical Roller Bearing-Sealed

d30 - 110mm



CYLINDRICAL BORE

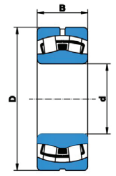


TAPERED BORE

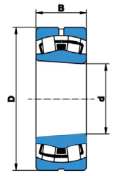
Principal Dimension			Basic Load Ratings		Fatigue Load Limit	Limiting speed	Mass	Designation
			Dynamic	Static				
d	D	B	C	C_0	P_u			
mm			kN		kN	r/min	kg	
30	62	25	64	60	6.4	2800	0.34	* BS2-2206-2CS
35	72	28	86.5	85	9.3	2400	0.52	* BS2-2207-2CS
40	80	28	96.5	90	9.8	2200	0.57	* BS2-2208-2CS
45	85	28	102	98	10.8	2000	0.66	* BS2-2209-2CS
50	90	28	104	108	11.8	1900	0.7	* BS2-2210-2CS
55	100	31	125	127	13.7	1700	1	* BS2-2211-2CS
60	110	34	156	166	18.6	1600	1.30	* BS2-2212-2CS
65	120	38	193	216	24	1500	1.60	* BS2-2213-2CS
70	125	38	208	228	25.5	1400	1.80	* BS2-2214-2CS
75	130	38	212	240	26.5	1300	2.10	* BS2-2215-2CS
80	140	40	236	270	29	1200	2.40	* BS2-2216-2CS
85	150	44	285	325	34.5	1100	3.00	* BS2-2217-2CS
90	160	48	325	375	39	1000	3.70	* BS2-2218-2CS
100	150	50	285	415	45.5	800	3.15	* 24020-2CS2/VT143
	165	52	365	490	53	850	4.55	* 23120-2CS2/VT143
	180	55	425	490	49	900	5.50	* BS2-2220-2CS
	180	60.3	475	600	63	700	6.85	* 23220-2CS
110	170	45	310	440	46.5	900	3.80	* 23022-2CS
	180	56	430	585	61	800	5.75	* 23122-2CS2/VT143
	180	69	520	750	78	630	7.10	* 24122-2CS2/VT143
	200	63	560	640	63	800	7.60	* BS2-2222-2CSS/VT143

Spherical Roller Bearing-Sealed

d120 - 200mm



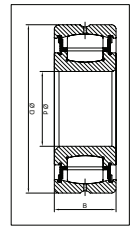
CYLINDRICAL BORE



TAPERED BORE

Principal Dimensions			Basic Load Rating		Limiting Speed	Mass	Designation
			Dynamic	Static			
d	D	B	C	C_0			
mm			kN		r/min	kg	
120	180	46	355	510	850	4.20	* 23024-2CS2/VT143
	180	60	430	670	670	5.45	* 24024-2CS2/VT143
	200	80	655	950	560	10.5	* 24124-2CS2/VT143
	215	69	630	765	750	9.75	* BS2-2224-2CS
130	200	52	430	610	800	6.00	* 23026-2CS2/VT143
	200	69	540	815	600	8.05	* 24026-2CS2/VT143
	210	80	680	1000	530	11.0	* 24126-2CS2/VT143
140	210	69	570	900	560	8.55	* 24028-2CS2/VT143
	225	85	673	1160	450	13.5	* 24128-2CS2/VT143
150	225	75	655	1040	530	10.5	* 24030-2CS2/VT143
	250	100	1020	1530	400	20.0	* 24130-2CS2/VT143
160	240	80	750	1200	450	13.0	* 24032-2CS2/VT143
	270	86	980	1370	530	20.5	* 24132-2CS2/VT143
170	260	90	930	1460	400	17.5	* 24034-2CS2/VT143
	280	109	1220	1860	360	27.5	* 24134-2CS2/VT143
180	280	100	1080	1730	380	23.0	* 24036-2CS2/VT143
190	320	128	1600	2500	340	43.0	* 24138-2CS2/VT143
200	340	140	1800	2800	320	53.5	* 24140-2CS
	360	128	1860	2700	430	58.0	* 23240-2CS2/VT143

Single Row Spherical Roller Bearing Sealed

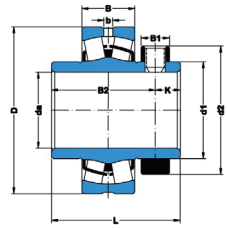


d mm	D mm	B mm	Limiting Speed Grease RPM	Basic Dynamic Rating KN	Mass Kg	Designation
25	52	18	9000	36	0.181	SSR-22205-2RS
30	62	20	8100	51	0.290	SSR-22206-2RS
35	72	23	6800	67	0.431	SSR-22207-2RS
40	80	23	6000	75	0.544	SSR-22208-2RS
45	85	23	5600	79	0.590	SSR-22209-2RS
50	90	23	5250	83	0.635	SSR-22210-2RS
55	100	25	4650	102	0.862	SSR-22211-2RS
60	110	28	4200	130	1.179	SSR-22212-2RS
65	120	31	3800	158	1.542	SSR-22213-2RS
70	125	31	3650	160	1.633	SSR-22214-2RS
75	130	31	3500	167	1.769	SSR-22215-2RS
80	140	33	3250	189	2.087	SSR-22216-2RS
85	150	36	3000	226	2.676	SSR-22217-2RS
90	160	40	2800	263	3.402	SSR-22218-2RS
95	170	43	2650	315	4.173	SSR-22219-2RS
100	180	46	2500	346	5.035	SSR-22220-2RS
110	200	53	2200	445	7.212	SSR-22222-2RS
120	215	58	2050	534	8.981	SSR-22224-2RS
130	230	64	1900	589	11.249	SSR-22226-2RS
140	250	68	1750	708	14.198	SSR-22228-2RS
150	270	73	1600	753	17.917	SSR-22230-2RS

d mm	D mm	B mm	Limiting Speed Grease RPM	Basic Dynamic Rating kN	Mass Kg	Designation
40	90	33	5250	114	1.043	SSR-22308-2RS
45	100	36	4650	134	1.406	SSR-22309-2RS
50	110	40	4200	166	1.860	SSR-22310-2RS
55	120	43	3800	184	2.404	SSR-22311-2RS
60	130	46	3500	243	2.994	SSR-22312-2RS
65	140	48	3250	266	3.538	SSR-22313-2RS
70	150	51	3000	304	4.309	SSR-22314-2RS
75	160	55	2800	333	5.398	SSR-22315-2RS
80	170	58	2650	345	6.305	SSR-22316-2RS
85	180	60	2500	423	7.348	SSR-22317-2RS
90	190	64	2350	438	8.709	SSR-22318-2RS
95	200	67	2200	487	10.297	SSR-22319-2RS
100	215	73	2050	573	12.882	SSR-22320-2RS

Roller Bearing Units

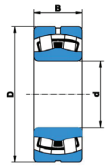
Insert Bearing/ Collar Mounted
4762XX series



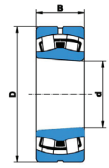
Shaft	mm				Basic Load Ratings(kN)		Set screw (in)	Brg Wt	Designation
dia.in.	d	D	B	L	Dynamic	Static		Kg	
1 7/16	36.5125								476208B-107
1 1/2	38.1	80	23	60.85	75.4	85.9	3/8-24X1/2	1.134	476208B-108
40	40								476208B-040
1 11/16	42.86								476209B-111
1 3/4	44.45	85	23	73.03	80.8	92.7	3/8-24X1/2	1.247	476209B-112
45	45								476209B-045
1 15/16	49.213								476210B-115
50	50	90	23	73.03	86.2	102	3/8-24X1/2	1.315	476210B-050
2	50.8								476210B-200
55	55	100	25	79.38	106	126	3/8-24X1/2	1.769	476211B-055
2 3/16	55.56								476211B-203
60	60								476213B-0.60
2 7/16	61.913	120	31	85.73	151	193	1/2-20X3/4	3.062	476213B-212
2 1/2	63.5								476213B-208
2 11/16	68.2625								476215B-211
2 3/4	69.85								476215B-212
70	70	130	31	92.08	161	204	1/2-20X7/8	4.241	476215B-070
2 15/16	74.61								476215B-215
75	75								476215B-075
3	76.2								476215B-300
85	85	160	40	102.39	248	344	1/2-20X7/8	6.124	476218B-085
3 7/16	87.31								476218B-307
100	100								476220B-100
3 15/16	100.01	180	46	116.69	324	449	5/8-18X1	8.845	476220B-315
4	101.6								476220B-400
110	110								476222B-110VSB
4 7/16	112.713								476222B-407VSB
4 1/2	114.3	200	53	155.58	411	588	5/8-20X7/8	13.381	476222B-408VSB
4 11/16	119.063								476222B-411VSB
4 15/16	125.413	230	64	168.28	550	810	5/8-20X7/8	21.092	476226B-415VSB
5	127								476226B-500VSB

Spherical Roller Bearing for vibratory applications

d40 - 180mm



CYLINDRICAL BORE

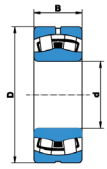


TAPERED BORE

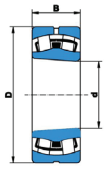
Principal Dimensions			Basic Load Ratings		Speed Ratings		Mass	Designations Bearings with Cylindrical Bore	Tapered Bore
			Dynamic	Static	Reference speed	Limiting speed			
d	D	B	C	C_0					
mm			kN		r/min		kg	-	
40	90	33	150	140	4800	6400	1,10	* 22308 E/VA405	-
45	100	36	183	183	4240	5600	1,40	* 22309 E/VA405	-
50	110	40	220	224	3840	5040	1,90	* 22310 E/VA405	-
55	120	43	270	280	3440	4480	2,45	* 22311 E/VA405	* 22311 EK/VA405
60	130	46	310	335	3200	4240	3,10	* 22312 E/VA405	* 22312 EK/VA405
65	140	48	340	360	3040	4000	3,75	* 22313 E/VA405	* 22313 EK/VA405
70	150	51	400	430	2720	3600	4,55	* 22314 E/VA405	* 22314 EK/VA405
75	160	55	440	475	2560	3440	5,55	* 22315 EJA/VA405	* 22315 EKJA/VA405
80	170	58	490	540	2400	3200	6,60	* 22316 EJA/VA405	* 22316 EKJA/VA405
85	180	60	550	620	2240	3040	7,65	* 22317 EJA/VA405	* 22317 EKJA/VA405
	180	60	550	620	2240	3040	7,65	* 22317 EJA/VA405	-
90	190	64	610	695	2080	2880	9,05	* 22318 EJA/VA405	* 22318 EKJA/VA405
95	200	67	670	765	2080	2720	10,5	* 22319 EJA/VA405	* 22319 EKJA/VA405
100	215	73	815	950	1920	2720	13,5	* 22320 EJA/VA405	* 22320 EKJA/VA405
	215	73	815	950	1920	2720	13,5	* 22320 EJA/VA405	-
110	240	80	950	1120	1600	2240	18,4	* 22322 EJA/VA405	* 22322 EKJA/VA405
	240	80	950	1120	1600	2240	18,4	* 22322 EJA/VA405	-
120	260	86	965	1120	1600	2080	23,0	* 22324 EJA/VA405	* 22324 CCKJA/ W33VA405
	260	86	965	1120	1600	2080	23,0	* 22324 EJA/VA405	-
130	280	93	1120	1320	1360	1920	29,0	* 22326 EJA/VA405	* 22326 CCKJA/ W33VA405
	280	93	1120	1320	1360	1920	29,0	* 22326 EJA/VA405	-
140	300	102	1290	1560	1360	1760	36,5	* 22328 EJA/VA405	* 22328 CCKJA/ W33VA405
	300	102	1290	1560	1360	1760	36,5	* 22328 EJA/VA405	-
150	320	108	1460	1760	1280	1600	43,5	* 22330 CCJA/W33VA405	* 22330 CCKJA/ W33VA405
	320	108	1460	1760	1280	1600	43,5	* 22330 CCJA/W33VA405	-
160	340	114	1600	1960	1200	1520	52,0	* 22332 CCJA/W33VA405	* 22332 CCKJA/ W33VA405
	340	114	1600	1960	1200	1520	52,0	* 22332 CCJA/W33VA405	-
170	360	120	1760	2160	1120	1440	61,0	* 22334 CCJA/W33VA405	* 22334 CCKJA/ W33VA405
	360	120	1760	2160	1120	1440	61,0	* 22334 CCJA/W33VA405	-
180	380	126	2000	2450	1040	1360	71,5	* 22336 CCJA/W33VA405	* 22336 CCKJA/ W33VA405
	380	126	2000	2450	1040	1360	71,5	* 22336 CCJA/W33VA405	-

Spherical Roller Bearing for vibratory applications

d190 - 240mm



CYLINDRICAL BORE

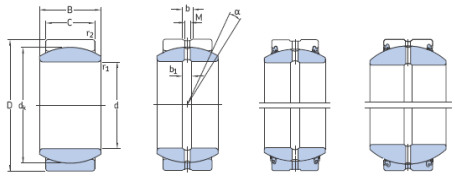


TAPERED BORE

Principal Dimensions			Basic Load Ratings		Speed Ratings		Mass	Designations Bearings with Cylindrical Bore	Tapered Bore
			Dynamic	Static	Reference speed	Limiting speed			
d	D	B	C	C_0					
mm			kN		r/min		kg	-	
190	400	132	2120	2650	960	1280	82,5	* 22338 CCJA/W33VA405	* 22338 CCKJA/ W33VA405
	400	132	2120	2650	960	1280	82,5	* 22338 CCJA/W33VA405	-
200	420	138	2320	2900	960	1200	95,0	* 22340 CCJA/W33VA405	* 22340 CCKJA/ W33VA405
	420	138	2320	2900	960	1200	95,0	* 22340 CCJA/W33VA405	-
220	460	145	2700	3450	800	1120	120	* 22344 CCJA/W33VA405	* 22344 CCKJA/ W33VA405
240	500	155	3100	4000	760	1040	155	* 22348 CCJA/W33VA405	* 22348 CCKJA/ W33VA405

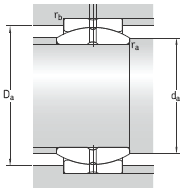
Plain Spherical Bearing

d4 - 40mm



Principle dimen-sions				Angle of tilt¹)	Basic load ratings		Mass	Designations2)	
					dynamic	static		without seals with standards seals	suffix for heavy-duty seals
d	D	B	C	a	C	Co			
mm				degrees	kN		kg		
4	12	5	3	16	2.04	10.2	0.003	GE 4 E	–
5	14	6	4	13	3.4	17	0.004	GE 5 E	–
6	14	6	4	13	3.4	17	0.004	GE 6 E	–
8	16	8	5	15	5.5	27.5	0.008	GE 8 E	–
10	19	9	6	12	8.15	40.5	0.012	GE 10 E	–
12	22	10	7	10	10.8	54	0.017	GE 12 E	–
15	26	12	9	8	17	85	0.032	GE 15 ES	–
	26	12	9	8	17	85	0.032	GE 15 ES-2RS	–
17	30	14	10	10	21.2	106	0.05	GE 17 ES	–
	30	14	10	10	21.2	106	0.05	GE 17 ES-2RS	–
20	35	16	12	9	30	146	0.065	GE 20 ES	–
	35	16	12	9	30	146	0.065	GE 20 ES-2RS	-2LS
	42	25	16	17	48	240	0.16	GEH 20 ES-2RS	-2LS
25	42	20	16	7	48	240	0.12	GE 25 ES	–
	42	20	16	7	48	240	0.12	GE 25 ES-2RS	-2LS
	47	28	18	17	62	310	0.2	GEH 25 ES-2RS	-2LS
30	47	22	18	6	62	310	0.16	GE 30 ES	–
	47	22	18	6	62	310	0.16	GE 30 ES-2RS	-2LS
	55	32	20	17	80	400	0.35	GEH 30 ES-2RS	-2LS
35	55	25	20	6	80	400	0.23	GE 35 ES	–
	55	25	20	6	80	400	0.23	GE 35 ES-2RS	-2LS
	62	35	22	15	100	500	0.47	GEH 35 ES-2RS	-2LS
40	62	28	22	7	100	500	0.32	GE 40 ES	–
	62	28	22	6	100	500	0.32	GE 40 ES-2RS	-2LS
	68	40	25	17	127	640	0.61	GEH 40 ES-2RS	-2LS

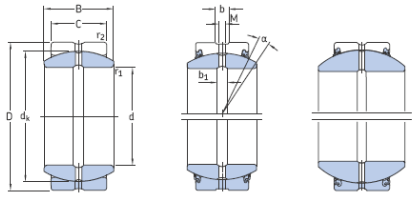
Plain Spherical Bearing



Dimensions							Abutment and fillet dimensions					
d	dk	b	b1	M	r1	r2	da	da	Da	Da	ra	rb
					min	min	min	max	min	max	max	max
mm							mm					
4	8	–	–	–	0.3	0.3	5.5	6.2	7.6	10.7	0.3	0.3
5	10	–	–	–	0.3	0.3	6.6	8	9.5	12.6	0.3	0.3
6	10	–	–	–	0.3	0.3	7.5	8	9.5	12.6	0.3	0.3
8	13	–	–	–	0.3	0.3	9.6	10.2	12.3	14.5	0.3	0.3
10	16	–	–	–	0.3	0.3	11.7	13.2	17.5	15.2	0.3	0.3
12	18	–	–	–	0.3	0.3	13.8	15	17.1	20.4	0.3	0.3
15	22	2.3	2.3	1.5	0.3	0.3	16.9	18.4	20.9	24.3	0.3	0.3
	22	2.3	2.3	1.5	0.3	0.3	16.9	18.4	22.8	24.3	0.3	0.3
17	25	2.3	2.3	1.5	0.3	0.3	19	20.7	23.7	28.3	0.3	0.3
	25	2.3	2.3	1.5	0.3	0.3	19	20.7	26	28.3	0.3	0.3
20	29	3.1	3.1	2	0.3	0.3	22.1	24.2	27.6	33.2	0.3	0.3
	29	3.1	3.1	2	0.3	0.3	22.1	24.2	30.9	33.2	0.3	0.3
	35.5	3.1	3.1	2	0.3	0.6	22.7	25.2	36.9	39.2	0.3	0.6
25	35.5	3.1	3.1	2	0.6	0.6	28.2	29.3	33.7	39.2	0.6	0.6
	35.5	3.1	3.1	2	0.6	0.6	28.2	29.3	36.9	39.2	0.6	0.6
	40.7	3.1	3.1	2	0.6	0.6	28.6	29.5	41.3	44	0.6	0.6
30	40.7	3.1	3.1	2	0.6	0.6	33.3	34.2	38.7	44	0.6	0.6
	40.7	3.1	3.1	2	0.6	0.6	33.3	34.2	41.3	44	0.6	0.6
	47	3.9	3.9	2.5	0.6	1	33.7	34.4	48.5	50.9	0.6	1
35	47	3.9	3.9	2.5	0.6	1	38.5	39.8	44.6	50.9	0.6	1
	47	3.9	3.9	2.5	0.6	1	38.5	39.8	48.5	50.9	0.6	1
	53	3.9	3.9	2.5	0.6	1	38.8	39.8	54.5	57.8	0.6	1
40	53	3.9	3.9	2.5	0.6	1	43.6	45	50.3	57.8	0.6	1
	53	3.9	3.9	2.5	0.6	1	43.6	45	54.5	57.8	0.6	1
	60	4.6	4.6	3	0.6	1	44.1	44.7	61	63.6	0.6	1

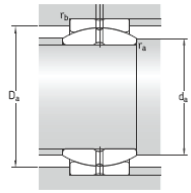
Plain Spherical Bearing

d45 - 120mm



Principle dimensions				Angle of tilt[1])	Basic load ratings		Mass	Designations2)	
					dynamic	static		without seals with standards seals	suffix for heavy-duty seals
d	D	B	C	a	C	Co			
mm				degrees	kN		kg		
45	68	32	25	7	127	640	0.46	GE 45 ES	–
	68	32	25	7	127	640	0.46	GE 45 ES-2RS	-2LS
	75	43	28	14	156	780	0.80	GEH 45ES-2RS	-2LS
50	75	35	28	6	156	780	0.56	GE 50 ES	–
	75	35	28	6	156	780	0.56	GE 50 ES-2RS	-2LS
	90	56	36	17	245	1220	1.60	GEH 50 ES-2RS	-2LS
60	90	44	36	6	245	1220	1.10	GE 60 ES	–
	90	44	36	6	245	1220	1.10	GE 60 ES-2RS	-2LS
	105	63	40	17	315	1560	2.40	GEH 60 ES-2RS	-2LS
70	105	49	40	6	315	1560	1.55	GE 70 ES	–
	105	49	40	6	315	1560	1.55	GE 70 ES-2RS	-2LS
	120	70	45	16	400	2000	3.40	GEH 70 ES-2RS	-2LS
80	120	55	45	6	400	2000	2.30	GE 80 ES	–
	120	55	45	5	400	2000	2.30	GE 80 ES-2RS	-2LS
	130	75	50	14	490	2450	4.10	GEH 80 ES-2RS	-2LS
90	130	60	50	5	490	2450	2.75	GE 90 ES	–
	130	60	50	5	490	2450	2.75	GE 90 ES-2RS	-2LS
	150	85	55	15	610	3050	6.30	GEH 90 ES-2RS	-2LS
100	150	70	55	7	610	3050	4.40	GE 100 ES	–
	150	70	55	6	610	3050	4.40	GE 100 ES-2RS	-2LS
	160	85	55	13	655	3250	6.80	GEH 100 ES-2RS	-2LS
110	160	70	55	6	655	3250	4.80	GE 110 ES	–
	160	70	55	6	655	3250	4.80	GE 110 ES-2RS	-2LS
	180	100	70	12	950	4750	11.0	GEH 110 ES-2RS	-2LS
120	180	85	70	6	950	4750	8.25	GE 120 ES	–
	180	85	70	6	950	4750	8.25	GE 120 ES-2RS	-2LS
	210	115	70	16	1080	5400	15.0	GEH 120 ES-2RS	-2LS

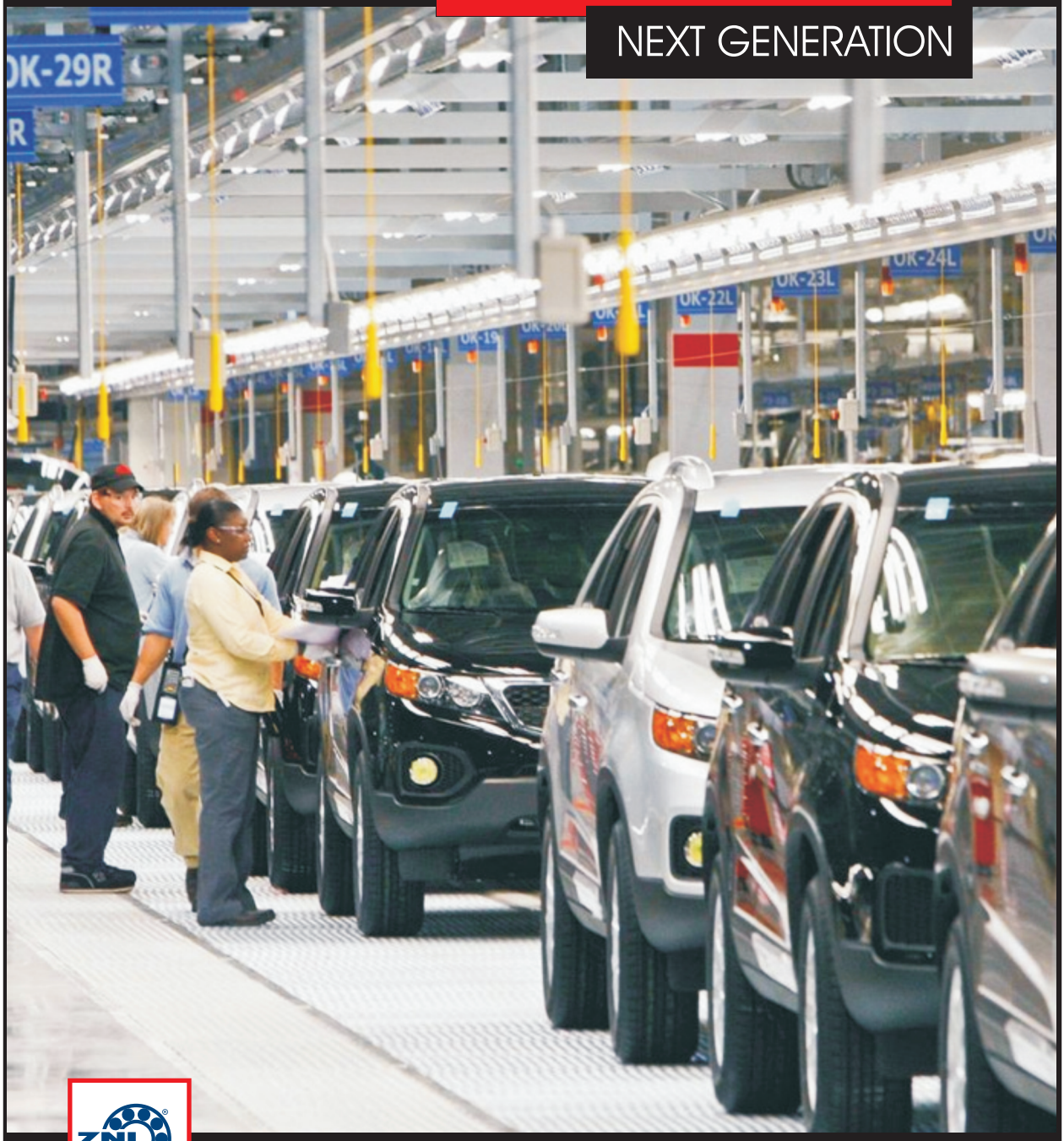
Plain Spherical Bearing



Dimensions							Abutment and fillet dimensions					
d	dk	b	b1	M	r1	r2	da	da	Da	Da	ra	rb
					min	min	min	max	min	max	max	max
mm							mm					
45	60	4.6	4.6	3	0.6	1	49.4	50.8	57	63.6	0.6	1
	60	4.6	4.6	3	0.6	1	49.4	50.8	61	63.6	0.6	1
	66	4.6	4.6	3	0.6	1	49.8	50.1	66.2	70.5	0.6	1
50	66	4.6	4.6	3	0.6	1	54.6	56	62.7	70.5	0.6	1
	66	4.6	4.6	3	0.6	1	54.6	56	66.2	70.5	0.6	1
	80	6.2	6.2	4	0.6	1	55.8	57.1	79.7	84.2	0.6	1
60	80	6.2	6.2	4	1	1	66.4	66.8	76	84.2	1	1
	80	6.2	6.2	4	1	1	66.4	66.8	79.7	84.2	1	1
	92	7.7	7.7	4	1	1	67	67	92	99	1	1
70	92	7.7	7.7	4	1	1	76.7	77.9	87.4	99	1	1
	92	7.7	7.7	4	1	1	76.7	77.9	92	99	1	1
	105	7.7	7.7	4	1	1	77.5	78.3	104.4	113.8	1	1
80	105	7.7	7.7	4	1	1	87.1	89.4	99.7	113.8	1	1
	105	7.7	7.7	4	1	1	87.1	89.4	104.4	113.8	1	1
	115	9.5	9.5	5	1	1	87.2	87.2	112.9	123.5	1	1
90	115	9.5	9.5	5	1	1	97.4	98.1	109.3	123.5	1	1
	115	9.5	9.5	5	1	1	97.4	98.1	112.9	123.5	1	1
	130	11.3	11.3	5	1	1	98.2	98.4	131	143.2	1	1
100	130	11.3	11.3	5	1	1	107.8	109.5	123.5	143.2	1	1
	130	11.3	11.3	5	1	1	107.8	109.5	131	143.2	1	1
	140	11.5	11.5	5	1	1	108.1	111.2	141.5	153.3	1	1
110	140	11.5	11.5	5	1	1	118	121	133	153	1	1
	140	11.5	11.5	5	1	1	118	121	141.5	153	1	1
	160	13.5	13.5	6	1	1	119.5	124.5	157.5	172	1	1
120	160	13.5	13.5	6	1	1	129.5	135.5	152	172	1	1
	160	13.5	13.5	6	1	1	129.5	135.5	157.5	172	1	1
	180	13.5	13.5	6	1	1	130	138.5	180	202.5	1	1

AUTOMOBILE INDUSTRIES

NEXT GENERATION



Spherical
Roller Thrust Bearings

Spherical Roller Thrust Bearing

Spherical Roller Thrust Bearing

In spherical roller thrust bearings the load is transmitted from one raceway to other at angel to the bearing axis. The bearings are therefore suitable for the accommodation of radial loads. Another important characteristic of spherical roller thrust bearings is their self aligning capability. This makes the bearings insensitive to shaft deflection and misalignment of the shaft relative to the housing

Mis Alignment

Spherical roller bearings are self aligning, i. e. they tolerate misalignment of the shaft relative to the housing and shaft deflections during operation.

The permissible misalignment is reduced as the load increases. The values indicated ca be permitted provided there is constant misalignment and a rotating shaft washer. In applications where there are shaft deftections or where the housing washer rotates, it is advisable to contact the ZNL application engineering service.

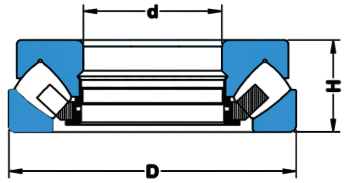
Whether the permissible misalignment can be fully exploited depends on the design of the bearing arrangement, the type of seal etc. when designing bearing arrangements where the housing washer is to rotate, or where the shaft washer will wobble. It is also advisable to contact the ZNL application engineering service.

Permissible Angular Misalignment

Bearing Series	Permissible Misalignment when bearing lond P0		
	< 0.05 Co	> 0.05 Co	> 0.3 Co
	degree		
292j	2	1.5	1
293j	2.5	1.5	0.3
294j	3	1.5	0.3

Spherical Roller Thrust Bearing

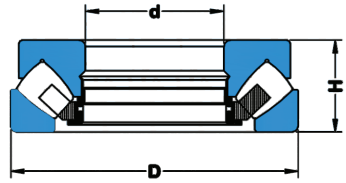
d60 - 220mm



Principle Dimension			Basic Load Rating		Limiting Speed Lubrication Oil	Mass	Designation
d mm	D	H	Dynamic C kN	Static C0 kN	RPM	Kg	
60	130	42	280	815	2400	2.60	29412 M
65	140	45	330	965	2200	3.30	29413 M
70	150	48	360	1060	2000	4	29414 M
75	160	51	415	1250	2000	4.87	29415 M
80	170	54	450	1370	1900	5.80	29416 M
85	180	58	510	1560	1800	6.90	29417 M
90	190	60	570	1760	1700	8.10	29418 M
100	210	67	680	2160	1500	11.8	29420 M
110	190	48	425	1430	1600	5.5	29322 M
	230	73	800	2550	1400	14.5	29422 M
120	210	54	530	1860	1400	7.58	29324 M
	250	78	900	2950	1300	18.1	29424 M
130	225	58	600	2120	1300	9.30	29326 M
	270	85	1060	3450	1200	22.5	29426 M
140	240	60	655	2320	1300	11	29328 M
	280	85	1100	3650	1200	24.2	29428 M
150	215	39	340	1340	1800	4.3	29230M
	250	60	670	2450	1200	11.5	29330 M
	300	90	1250	4250	1100	29.4	29430 M
160	225	39	360	1460	1700		29232 M
	270	67	780	2850	1100	15.2	29332 M
	320	95	1400	4800	1000	35.5	29432 M
170	240	42	427	1770			29234 M
	280	67	800	2950	1100	16	29334 M
	340	103	1560	5400	940	43.7	29434 M
180	250	42	450	1920	1600		29236 M
	300	73	950	3550	1000	20.3	29336 M
	360	109	1730	6100	890	52	29436 M
190	270	48	530	2230	1400		29238 M
	320	78	1080	4050	940	24.8	29338 M
	380	115	1900	6700	840	60	29438 M
200	280	48	535	2300	1400	9.3	29240 M
	340	85	1250	4800	890	30.8	29340 M
	400	122	2120	7500	790	69	29440 M
220	300	48	550	2400	1300	10	29244 M
	360	85	1290	5000	840	32.8	29344 M
	420	122	2200	8000	750	74	29444 M

Spherical Roller Thrust Bearing

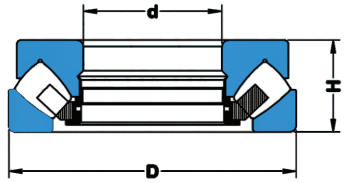
d240 - 400mm



Principle Dimension			Basic Load Rating		Limiting Speed Lubrication Oil	Mass	Designation
d mm	D	H	Dynamic C kN	Static C0 kN	RPM	Kg	
240	340	60	750	3450	890	16.7	29248 M
	380	85	1320	5200	790	35.5	29348 M
	440	122	2240	8300	750	79	29448 M
260	360	60	780	3650	890	18.5	29252 M
	420	95	1320	6800	750	49	29352 M
	480	132	2600	9800	670	105	29452 M
280	380	60	815	3900	840	19.5	29256 M
	440	95	1730	7100	710	53	29356 M
	520	145	3100	11800	630	132	29456 M
300	420	73	1000	4650	750	30.5	29260 M
	480	109	2080	8500	630	74	29360 M
	540	145	3100	11800	600	140	29460 M
320	440	73	1020	4900	710	33	29264 M
	500	109	2120	8800	630	77	29364 M
	580	155	3750	14600	560	175	29464 M
340	460	73	1130	5400	480	33.5	29268 M
	540	122	2550	10600	560	103	29368 M
	620	170	4150	16300	500	218	29468 M
360	500	85	1340	6550	630	52	29272 M
	560	122	2600	11000	560	107	29372 M
	640	170	4400	17000	490		29472 M
380	520	85	1500	7500	600	53	29276 M
	670	175	4550	18300	470	254	29476 M
	600	132	3200	13000	800		29376 M
400	540	85	1610	8000	695	55.5	29280 M
	620	132	3450	14600	1200	150	29380 M
	710	185	6560	26500	1960	310	29480 M

Spherical Roller Thrust Bearing - Steel Type Cage

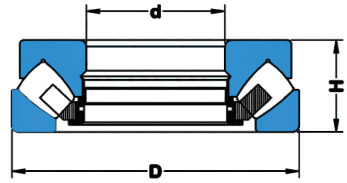
d60 - 240mm



Principle Dimension			Basic Load Rating		Fatigue Load Limit	Minimum Load Factor	Speed Rating		Mass	Designation
			Dynamic	Static			Reference Speed	Limiting Speed		
d mm	D	H	C	C0	Pu kN	A	RPM		Kg.	
60	130	42	390	915	114	0.080	2800	5000	2.60	29412J
65	140	45	455	1080	137	0.11	2600	4800	3.20	29413J
70	150	48	520	1250	153	0.15	2400	4300	3.90	29414J
75	160	51	600	1430	173	0.19	2400	4000	4.70	29415J
80	170	54	670	1630	193	0.25	2200	3800	5.60	29416J
85	150	39	380	1060	129	0.11	2400	4000	2.75	29317J
	180	58	735	1800	212	0.31	2000	3600	6.75	29417J
90	155	39	400	1080	132	0.11	2400	4000	2.85	29318J
	190	60	815	2000	232	0.38	1900	3400	7.75	29418J
100	170	42	465	1290	156	0.16	2200	3600	3.65	29320J
	210	67	980	2500	275	0.59	1700	3000	10.5	29420J
110	190	48	610	1730	204	0.28	1900	3200	5.30	29322J
	230	73	1180	3000	325	0.86	1600	2800	13.5	29422J
120	210	54	765	2120	245	0.43	1700	2800	7.35	29324J
	250	78	1370	3450	375	1.1	1500	2600	17.5	29424J
130	225	58	865	2500	280	0.59	1600	2600	9	29326J
	270	85	1560	4150	430	1.65	1300	2400	23	29426J
140	240	60	980	2850	315	0.77	1500	2800	10.5	29328J
	280	85	1630	4400	450	1.8	1300	2400	23	29428J
150	250	60	1000	2850	315	0.77	1500	2400	11	29330J
	300	90	1860	5100	520	2.5	1200	2200	28	29430J
160	270	67	1180	3450	365	1.1	1300	2200	14.5	29332J
	320	95	2080	5000	570	3	1100	2000	33.5	29432J
170	280	67	1260	3550	365	1.2	1300	2200	15	29334J
	340	103	2360	3550	340	4.1	1100	1900	44.5	29434J
180	300	73	1430	4300	440	1.8	1200	2000	19.5	29336J
	360	109	2600	7350	710	5.1	1000	1800	52.5	29436J
190	320	78	1630	4750	500	2.1	1100	1900	23.5	29338J
	380	115	2850	8150	765	6.1	950	1700	60.5	29438J
200	340	85	1860	5500	550	2.9	1000	1700	29.5	29340J
	400	122	3200	9000	850	7.7	850	1600	72	29440J
220	360	85	2000	6300	610	3.8	1000	1700	33.5	29344J
	420	122	3350	9650	900	8.8	850	1500	75	29444J
240	380	85	2040	6550	630	4.1	1000	1600	35.5	29348J
	440	122	3400	10200	930	9.9	850	1500	80.5	29448J

Spherical Roller Thrust Bearing - Steel Type Cage

d260 - 300mm



Principle Dimension			Basic Load Rating		Fatigue Load Limit	Minimum Load Factor	Speed Rating		Mass	Designation
			Dynamic	Static			Reference Speed	Limiting Speed		
d mm	D	H	C	C0	Pu kN	A	RPM		Kg.	
260	420	95	2550	8300	780	6.5	850	1400	49	29352J
	480	132	4050	12500	1140	16	750	1300	105	29452J
280	440	95	2550	8650	815	7.1	850	1400	53	29356J
	520	145	4900	15300	1320	22	670	1200	135	29456J
300	480	109	3100	10400	950	11	750	1200	75	29360J
	540	145	4310	16600	1340	26	600	1200	140	29460J

Needle
Roller Bearings

Needle Roller Bearing

Needle Roller Bearing

In these bearings rolling element are cylindrical roller whose length is minimum 3 times larger than diameter, so it is used where limited space between shaft and housing. Needle roller bearings carry high load. Needle roller bearings suitable for low and medium speed.

Type of Needle Bearings

Cage and Needle roller

Drawn cup needle roller bearings

Solid needle roller bearings

Thrust needle roller bearings

Roller followers

Series Available

NKI , NA48 , NA49 , NA69

Needle Roller Bearings without inner ring

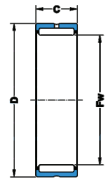
NK, RNA 48 RNA 49 RNA 69

Needle Roller and cage assembly

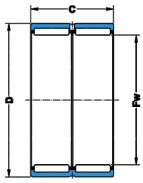
NEEDLE ROLLER BEARING WITHOUT INNER RING.

Needle Roller Bearing With Flange Without Inner Ring

d8 - 24mm



SERIES NK(S),RNA 49

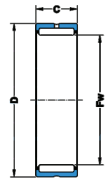


SERIES RNA 69

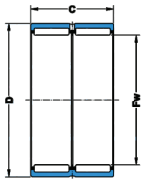
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	C	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
8	15	12	3.8	4.25	28000	40000	0.009	NK 8/12
	15	16	5.01	5.85	28000	40000	0.012	NK 8/16
9	16	12	4.4	5.2	24000	36000	0.01	NK 9/12
	16	16	5.01	5.85	28000	40000	0.012	NK 9/16
10	17	12	4.57	5.7	22000	34000	0.012	NK 10/12
	17	16	5.94	8	22000	34000	0.013	NK 10/16
12	19	12	6.71	8.15	19000	30000	0.014	NK 12/12
	19	16	9.13	12	19000	30000	0.016	NK12/16
14	22	13	8.8	10.4	17000	26000	0.018	RNA 4900
	22	16	10.2	12.5	17000	26000	0.021	NK 14/16
	22	20	12.8	16.6	17000	26000	0.026	NK 14/20
15	23	16	11	14	16000	24000	0.022	NK 15/16
	23	20	13.8	18.3	16000	24000	0.027	NK 15/20
16	24	13	9.9	12.2	16000	24000	0.02	RNA 4901
	24	16	11.7	15.3	16000	24000	0.022	NK 16/16
	24	20	14.5	20	16000	24000	0.032	NK 16/20
	24	22	16.1	23.2	16000	24000	0.032	RNA 6901
17	25	16	12.1	16.6	15000	22000	0.029	NK 17/16
	25	20	15.1	22	15000	22000	0.03	NK 17/20
18	26	16	12.8	17.6	15000	22000	0.025	NK 18/16
	26	20	16.1	23.6	15000	22000	0.032	NK 18/20
19	27	16	13.4	19	14000	20000	0.026	NK 19/16
	27	20	16.5	25.5	14000	20000	0.032	NK 19/20
20	28	13	11.2	15.3	13000	19000	0.022	RNA 4902
	28	16	13.2	19.3	13000	19000	0.027	NK 20/16
	28	20	16.5	2.55	13000	19000	0.034	NK 20/20
	28	23	17.2	27	13000	19000	0.04	RNA 6902
21	29	16	13.8	20	13000	19000	0.028	NK 21/16
	29	20	17.2	27	13000	19000	0.035	NK 21/20
22	30	13	11.4	16.3	12000	18000	0.022	RNA 4903
	30	16	14.2	21.6	12000	18000	0.03	NK 22/16
	30	20	17.9	29	12000	18000	0.037	NK 22/20
	30	23	18.7	30.5	12000	18000	0.042	RNA 6903
24	32	16	15.4	24.5	10000	16000	0.032	NK 24/16
	32	20	19	32.5	10000	16000	0.04	NK 24/20
	37	20	26	33.5	9500	15000	0.065	NKS 24

Needle Roller Bearing With Flange Without Inner Ring

d25 - 40mm



SERIES NK(S),RNA 49

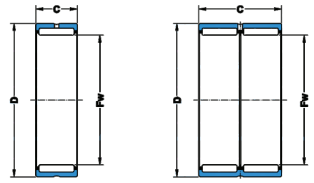


SERIES RNA 69

Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	C	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
25	33	16	15.1	24.5	10000	16000	0.033	NK 25/16
	33	20	19	32.5	10000	16000	0.042	NK 25/20
	37	17	21.6	28	9500	15000	0.052	RNA 4904
	37	30	35.2	53	9500	15000	0.100	RNA 6904
	38	20	27.5	36	9500	15000	0.068	NKS 25
26	34	16	15.7	26	9500	15000	0.034	NK 26/16
	34	20	19.4	34.5	9500	15000	0.042	NK 26/20
28	37	20	22	36.5	9000	14000	0.052	NK 28/20
	37	30	31.9	60	9000	14000	0.082	NK 28/30
	39	17	23.3	32	9000	14000	0.050	RNA 49/22
28	39	30	36.9	57	9000	14000	0.098	RNA 69/22
	42	20	28.6	39	8500	13000	0.084	NKS 28
29	38	20	22	36.5	9000	14000	0.054	NK 29/20
	38	30	31.9	60	9000	14000	0.084	NK 29/30
30	40	20	22.9	38	8500	13000	0.065	NK 30/20
	40	30	33	63	8500	13000	0.098	NK 30/30
	42	17	24.2	34.5	8500	13000	0.061	RNA 4905
	42	30	38	62	8500	13000	0.11	RNA 6905
	45	22	31.9	43	8000	12000	0.10	NKS 30
32	42	20	23.3	40.5	8000	12000	0.068	NK 32/20
	42	30	34.1	65.5	8000	12000	0.10	NK 32/30
	45	17	25.1	36.5	8000	12000	0.073	NK 49/28
	45	30	39.6	65.5	8000	12000	0.14	RNA 69/28
	47	22	34.1	46.5	8000	12000	0.11	NKS 32
35	45	20	24.6	45	7500	11000	0.074	NK 35/20
	45	30	35.8	72	7500	11000	0.11	NK 35/30
	47	17	25.5	39	7500	11000	0.070	RNA 4906
	47	30	42.9	75	7500	11000	0.13	RNA 6906
	50	22	35.2	50	7500	11000	0.12	NKS 35
37	47	20	25.1	46.5	7500	11000	0.077	NK 37/20
	47	30	36.9	76.5	7500	11000	0.11	NK 37/30
	52	22	36.9	54	7000	10000	0.12	NKS 37
38	48	20	25.5	49	7500	11000	0.080	NK 38/20
	48	30	37.4	80	7500	11000	0.12	NK 38/30
40	50	20	26.4	51	7000	10000	0.083	NK 40/20
	50	30	38	83	7000	10000	0.13	NK 40/30
	52	20	30.8	51	7000	10000	0.090	RNA 49/32

Needle Roller Bearing With Flange Without Inner Ring

d43 - 72mm

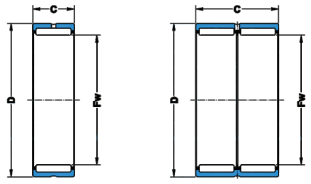


SERIES NK(S),RNA 49 SERIES RNA 69

Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	C	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
43	53	20	27.5	55	6700	9500	0.086	NK 43/20
	53	30	40.2	90	6700	9500	0.13	NK 43/30
	58	22	39.1	61	6300	9000	0.14	NKS 43
45	55	20	27.5	57	6300	9000	0.092	NK 45/20
	55	30	40.2	93	6300	9000	0.14	NK 45/30
	60	22	40.2	64	6000	8500	0.15	NKS 45
47	57	20	29.2	61	6000	8500	0.095	NK 47/20
	57	30	41.8	98	6000	8500	0.14	NK 47/30
48	62	22	42.9	71	5600	8000	0.14	RNA 4908
	62	40	67.1	125	5600	8000	0.26	RNA 6908
50	62	25	38	78	5600	8000	0.16	NK 50/25
	62	35	49.5	110	5600	8000	0.22	NK 50/35
	65	22	42.9	72	5600	8000	0.16	NKS 50
52	68	22	45.7	78	5300	7500	0.18	RNA 4909
	68	40	70.4	137	5300	7500	0.34	RNA 6909
55	68	25	40.2	88	5300	7500	0.18	NK 55/25
	68	35	52.3	122	5300	7500	0.25	NK 55/35
	72	22	44.6	78	5000	7000	0.22	NKS 55
58	72	22	47.3	85	5000	7000	0.16	RNA 4910
	72	40	73.7	150	5000	7000	0.31	RNA 6910
60	72	25	41.8	96.5	4800	6700	0.19	NK 60/25
	72	35	55	134	4800	6700	0.26	NK 60/35
	80	28	62.7	104	4500	6300	0.34	NKS 60
63	80	25	57.2	106	4500	6300	0.26	RNA 4911
	80	45	89.7	190	4500	6300	0.47	RNA 6911
65	78	25	44	104	4500	6300	0.22	NK 65/25
	78	35	58.3	146	4500	6300	0.31	NK 65/35
	85	28	66	114	4300	6000	0.36	NKS 65
68	82	25	44	95	4300	6000	0.24	NK 68/25
	82	35	60.5	146	4300	6000	0.34	NK 68/35
	85	25	60.5	114	4300	6000	0.28	RNA 4912
	85	45	93.5	204	4300	6000	0.49	RNA6912
70	85	25	44.6	98	4300	6000	0.26	NK 70/25
	85	35	61.6	150	4300	6000	0.37	NK 70/35
	90	28	68.2	120	4000	5600	0.38	NKS 70
72	90	25	61.6	120	4000	5600	0.31	RNA 4913
	90	45	95.2	212	4000	5600	0.58	RNA 6913

Needle Roller Bearing With Flange Without Inner Ring

d73 - 130mm

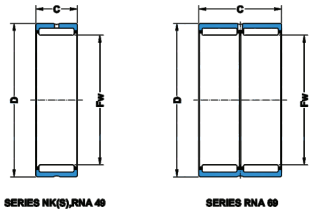


SERIES NK(S),RNA 49 SERIES RNA 69

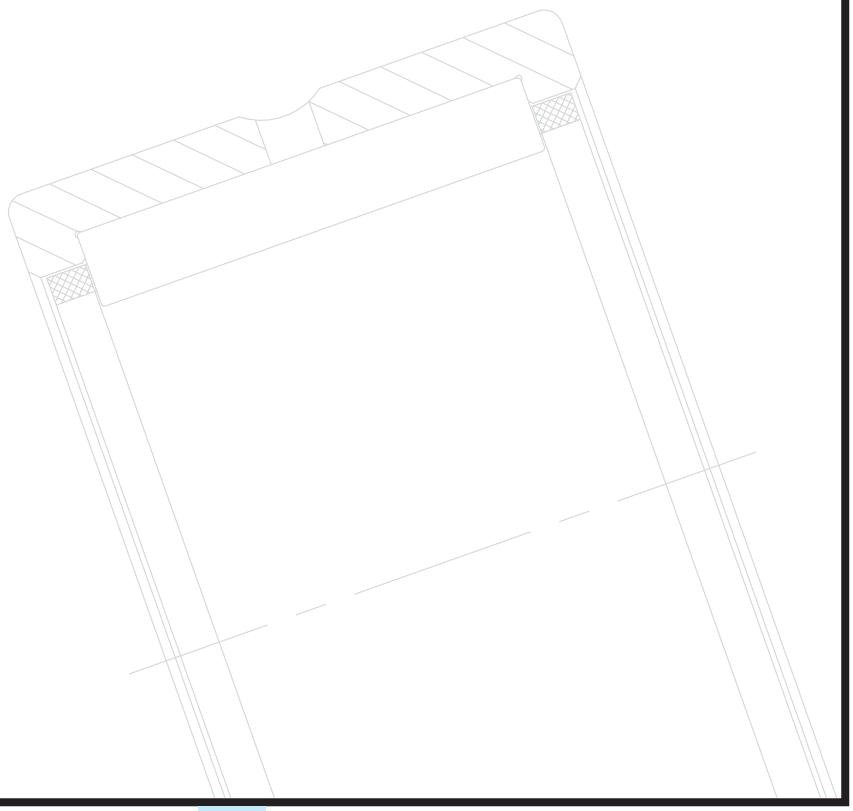
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	C	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
73	90	25	52.8	106	4000	5600	0.30	NK 73/25
	90	35	73.7	163	4000	5600	0.42	NK 73/35
75	92	25	53.9	110	3800	5300	0.32	NK 75/25
	92	35	74.8	170	3800	5300	0.45	NK 75/35
	95	28	70.4	132	3800	5300	0.40	NKS 75
80	95	25	56.1	127	3600	5000	0.30	NK 80/25
	95	35	76.5	190	3600	5000	0.43	NK 80/35
	100	28	74.8	140	3600	5000	0.41	NKS 80
	100	30	84.2	163	3600	5000	0.46	RNA 4914
	100	54	128	285	3600	5000	0.86	RNA 6914
85	105	25	69.3	132	3400	4800	0.43	NK 85/25
	105	30	84.2	170	3400	4800	0.60	RNA 4915
	105	35	96.8	200	3400	4800	0.49	NK 85/35
	105	54	130	290	3400	4800	0.94	RNA 6915
90	110	25	72.1	140	3200	4500	0.45	NK 90/25
	110	30	88	183	3200	4500	0.52	RNA 4916
	110	35	101	216	3200	4500	0.63	NK 90/35
	110	54	134	315	3200	4500	1.00	RNA 6916
95	115	26	73.7	146	3000	4300	0.49	NK 95/26
	115	36	105	232	3000	4300	0.68	NK 95/36
100	120	26	76.5	156	2800	4000	0.52	NK 100/26
	120	35	108	250	2800	4000	0.66	RNA 4917
	120	36	108	250	2800	4000	0.72	NK 100/36
	120	63	165	425	2800	4000	1.20	RNA 6917
105	125	26	78.1	166	2600	3800	0.54	NK 105/26
	125	35	112	265	2600	3800	0.75	RNA 4918
	125	36	112	265	2600	3800	0.80	NK 105/36
	125	63	172	450	2600	3800	1.35	RNA 6918
110	130	30	96.8	220	2400	3600	0.65	NK 110/30
	130	35	114	270	2400	3600	0.72	RNA 4919
	130	40	123	305	2400	3600	0.83	NK 110/40
	130	63	172	465	2400	3600	1.45	RNA 6919
115	135	32	91.3	220	2400	3600	0.70	NKS 115
	140	40	125	280	2200	3400	1.20	RNA 4920
120	140	30	93.5	232	2200	3400	0.67	RNA 4822
125	150	40	130	300	2000	3200	1.25	RNA 4922
130	150	30	99	255	2000	3200	0.73	RNA 4824

Needle Roller Bearing With Flange Without Inner Ring

d135 - 285mm

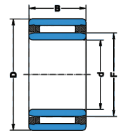


Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	C	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
135	165	45	176	405	1900	3000	1.85	RNA 4924
145	165	35	119	325	1800	2800	1.00	RNA 4826
150	180	50	198	480	1700	2600	2.20	RNA 4926
155	175	35	121	345	1700	2600	1.05	RNA 4828
160	190	50	205	510	1600	2400	2.35	RNA 4928
165	190	40	147	415	1600	2400	1.60	RNA 4830
175	200	40	157	450	1500	2200	1.70	RNA 4832
185	215	45	179	520	1500	2200	2.55	RNA 4834
195	225	45	190	570	1400	2000	2.70	RNA 4836
210	240	50	220	710	1300	1900	3.20	RNA 4838
220	250	50	224	735	1200	1800	3.35	RNA 4840
240	270	50	238	815	1100	1700	3.60	RNA 4844
265	300	60	347	1120	950	1500	5.40	RNA 4848
285	320	60	358	1200	900	1400	5.80	RNA 4852

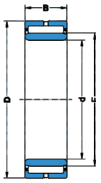


Needle Roller Bearing With Flange With Inner Ring

d9 - 38mm



SERIES NKI(S),NA49

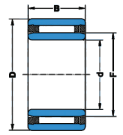


SERIES NA69

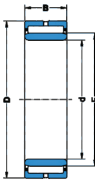
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
9	19	16	9.13	12	19000	30000	0.022	NKI 9/16
10	22	16	10.2	12.5	17000	26000	0.029	NKI 10/16
	22	20	12.8	16.6	17000	26000	0.037	NKI 10/20
12	24	16	11.7	15.3	16000	24000	0.033	NKI 12/16
	24	20	14.5	20	16000	24000	0.042	NKI 12/20
	24	22	16.1	23.2	16000	24000	0.046	NA 6901
15	27	20	16.5	25.5	14000	20000	0.049	NKI 15/20
	28	13	11.2	15.3	13000	19000	0.034	NA 4902
	28	23	17.2	27	13000	19000	0.064	NA 6902
17	29	20	17.2	27	13000	19000	0.054	NKI 17/20
	30	13	11.4	16.3	12000	18000	0.037	NA 4903
	30	23	18.7	30.5	12000	18000	0.072	NA 6903
20	32	20	19	32.5	10000	16000	0.061	NKI 20/20
	37	17	21.6	28.000	9500	15000	0.075	NA 4904
	37	30	35.2	53.000	9500	15000	0.14	NA 6904
	42	20	28.6	39.000	8500	13000	0.13	NKIS 20
22	34	20	19.4	34.500	9500	15000	0.065	NKI 22/20
	39	17	23.3	32.000	9000	14000	0.080	NA 49/22
	39	30	36.9	57.000	9000	14000	0.15	NA 69/22
25	38	30	31.9	60.000	9000	14000	0.12	NKI 25/30
	42	17	24.2	34.500	8500	13000	0.088	NA 4905
	42	30	38	62.000	8500	13000	0.16	NA 6905
	47	22	34.1	46.500	8000	12000	0.16	NKIS 25
28	42	30	34.1	65.500	8000	12000	0.15	NKI 28/30
	45	17	25.1	36.500	8000	12000	0.098	NA 49/28
	45	30	39.6	65.500	8000	12000	0.18	NA 69/28
30	45	30	35.8	72.000	7500	11000	0.17	NKI 30/30
	47	17	25.5	39.000	7500	11000	0.10	NA 4906
	47	30	42.9	75.000	7500	11000	0.19	NA 6906
35	50	20	26.4	51	7000	10000	0.13	NKI 35/20
	50	30	38	83	7000	10000	0.19	NKI 35/30
	55	20	31.9	54	6700	9500	0.17	NA 4907
	55	36	48.4	93	6700	9500	0.31	NA 6907
	58	22	39.1	61	6300	9000	0.22	NKIS 35
38	53	20	27.5	55	6700	9500	0.14	NKI 38/20
	53	30	40.2	90	6700	9500	0.21	NKI 38/30

Needle Roller Bearing With Flange With Inner Ring

d40 - 70mm



SERIES NKI(B),NA49

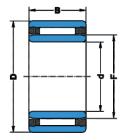


SERIES NA69

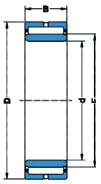
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
40	55	20	27.5	57	6300	9000	0.14	NKI 40/20
	55	30	40.2	93	6300	9000	0.22	NKI 40/30
	62	22	42.9	71	5600	8000	0.23	NA 4908
	62	40	67.1	125	5600	8000	0.43	NA 6908
	65	22	42.9	72	5600	8000	0.28	NKIS 40
42	57	20	29.2	61	6000	8500	0.15	NKI 42/20
	57	30	41.8	98	6000	8500	0.22	NKI 42/30
45	62	25	38	78	5600	8000	0.23	NKI 45/25
	62	35	49.5	110	5600	8000	0.32	NKI 45/35
	68	22	45.7	78	5300	7500	0.27	NA 4909
	68	40	70.4	137	5300	7500	0.50	NA 6909
	72	22	44.6	78	5000	7000	0.34	NKIS 45
50	68	25	40.2	88	5300	7500	0.27	NKI 50/25
	68	35	52.3	122	5300	7500	0.38	NKI 50/35
	72	22	47.3	85	5000	7000	0.27	NA 4910
	72	40	73.7	150	5000	7000	0.52	NA 6910
	80	28	62.7	104	4500	6300	0.52	NKIS 50
55	72	25	41.8	96.5	4800	6700	0.27	NKI 55/25
	72	35	55	134	4800	6700	0.38	NKI 55/35
	80	25	57.2	106	4500	6300	0.40	NA 4911
	80	45	89.7	190	4500	6300	0.78	NA 6911
	85	28	66	114	4300	6000	0.56	NKIS 55
60	82	25	44	95	4300	6000	0.40	NKI 60/25
	82	35	60.5	146	4300	6000	0.55	NKI 60/35
	85	25	60.5	114	4300	6000	0.43	NA 4912
	85	45	93.5	204	4300	6000	0.81	NA 6912
	90	28	68.2	120	4000	5600	0.56	NKIS 60
65	90	25	61.6	120	4000	5600	0.46	NA 4913
	90	25	52.8	106	4000	5600	0.47	NKI 65/25
	90	35	73.7	163	4000	5600	0.66	NKI 65/35
	90	45	95.2	212	4000	5600	0.83	NA 6913
	95	28	70.4	132	3800	5300	0.64	NKIS 65
70	95	25	56.1	127	3600	5000	0.52	NKI 70/25
	95	35	76.5	190	3600	5000	0.74	NKI 70/35
	100	28	74.8	140	3600	5000	0.68	NKIS 70
	100	30	84.2	163	3600	5000	0.73	NA 4914
	100	54	128	285	3600	5000	1.35	NA 6914

Needle Roller Bearing With Flange With Inner Ring

d75 - 190mm



SERIES NKI(S),NA49

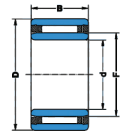


SERIES NA69

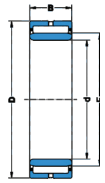
Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
75	105	25	69.3	132	3400	4800	0.64	NKI 75/25
	105	30	84.2	170	3400	4800	0.78	NA 4915
	105	35	96.8	200	3400	4800	0.91	NKI 75/35
	105	54	130	290	3400	4800	1.45	NA 6915
80	110	25	72.1	140	3200	4500	0.68	NKI 80/25
	110	30	88	183	3200	4500	0.88	NA 4916
	110	35	101	216	3200	4500	0.96	NKI 80/35
	110	54	134	315	3200	4500	1.50	NA 6916
85	115	26	73.7	146	3000	4300	0.75	NKI 85/26
	115	36	105	232	3000	4300	1.05	NKI 85/36
	120	35	108	250	2800	4000	1.25	NA 4917
	120	63	165	425	2800	4000	2.20	NA 6917
90	120	26	76.5	156	2800	4000	0.78	NKI 90/26
	120	36	108	250	2800	4000	1.10	NKI 90/36
	125	35	112	265	2600	3800	1.30	NA 4918
	125	63	172	450	2600	3800	2.30	NA 6918
95	125	26	78.1	166	2600	3800	0.82	NKI 95/26
	125	36	112	265	2600	3800	1.15	NKI 95/36
	130	35	114	270	2440	3600	1.40	NA 4919
	130	63	172	465	2400	3600	2.50	NA 6919
100	130	30	96.8	220	2400	3600	1.00	NKI 100/30
	130	40	123	305	2400	3600	1.35	NKI 100/40
	135	32	91.3	220	2400	3600	1.35	NKIS 100
	140	40	125	280	2200	3400	1.90	NA 4920
110	140	30	93.5	232	2200	3400	1.10	NA 4822
	150	40	130	300	2000	3200	2.10	NA 4922
120	150	30	99	255	2000	3200	1.15	NA 4824
	165	45	176	405	1900	3000	2.85	NA 4924
130	165	35	119	325	1800	2800	1.80	NA 4826
	180	50	198	480	1700	2600	3.90	NA 4926
140	175	35	121	345	1700	2600	1.95	NA 4828
	190	50	205	510	1600	2400	4.15	NA 4928
150	190	40	147	415	1600	2400	2.70	NA 4830
160	200	40	157	450	1500	2200	2.90	NA 4832
170	215	45	179	520	1500	2200	4.00	NA 4834
180	225	45	190	570	1400	2000	4.20	NA 4836
190	240	50	220	710	1300	1900	5.60	NA 4838

Needle Roller Bearing With Flange With Inner Ring

d220 - 300mm



SERIES NKI(B),NA49

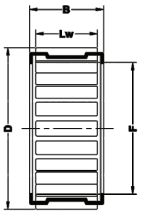


SERIES NA69

Principal Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
Fw mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
200	250	50	224	735	1200	1800	5.85	NA 4840
220	270	50	238	815	1100	1700	6.40	NA 4844
240	300	60	347	1120	950	1500	10.0	NA 4848
260	320	60	358	1200	900	1400	10.5	NA 4852
280	350	69	429	1320	850	1300	15.5	NA 4856
300	380	80	594	1800	750	1100	22.0	NA 4860

Needle Roller and Cage Assemblies

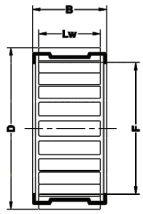
d8 - 15mm



Boundary Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
F mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
8	11	8	3.1	3.2	19000	32000	0.002	K8*11*8
	11	10	3.8	4.25	19000	32000	0.002	K8*11*10
	11	13	5	5.85	19000	32000	0.003	K8*11*13
	12	13	5.85	6	19000	32000	0.005	K8*12*13
9	12	10	4.05	4.75	18000	30000	0.003	K9*12*10
	12	13	5.3	6.55	18000	30000	0.004	K9*12*3
10	13	9	4.6	5.7	17000	28000	0.002	K10*13*9
	13	10	5.2	6.55	17000	28000	0.002	K10*13*10
	13	13	5.6	7.35	17000	28000	0.004	K10*13*13
	13	16	7.1	9.8	17000	28000	0.004	K10*13*16
	14	10	5.85	6.4	18000	30000	0.004	K10*14*10
	14	13	7.5	8.8	18000	30000	0.005	K10*14*13
11	14	10	4.55	5.7	17000	28000	0.003	K11*14*10
12	15	9	4.55	5.85	16000	26000	0.002	K12*15*9
	15	10	5.6	7.65	16000	26000	0.003	K12*15*10
	15	13	6.4	9.15	16000	26000	0.004	K12*15*13
	15	15	6.7	9.65	16000	26000	0.005	K12*15*15
	16	10	6.55	7.8	16000	26000	0.005	K12*16*10
	16	13	7.1	8.65	16000	26000	0.007	K12*16*13
	17	13	8.5	9.5	17000	28000	0.008	K12*17*13
	17	14	9.8	11.4	17000	28000	0.009	K12*17*14
	18	12	9.5	9.8	17000	28000	0.009	K12*18*12
13	17	10	6.8	8.5	16000	26000	0.005	K13*17*10
	18	15	1.04	12.2	16000	26000	0.011	K13*18*15
14	18	8	5.1	6	16000	26000	0.005	K14*18*8
	18	10	6.8	8.5	16000	26000	0.005	K14*18*10
	18	13	9.15	12.5	16000	26000	0.007	K14*18*13
	18	15	1.0	1.4	16000	26000	0.007	K14*18*15
	18	16	9.5	12.9	16000	26000	0.007	K14*18*16
	18	17	11.8	17.9	16000	26000	0.008	K14*18*17
	19	13	9.8	11.6	16000	26000	0.007	K14*19*13
	19	18	12.5	16.3	16000	26000	0.014	K14*19*18
	20	12	1.0	10.8	16000	26000	0.010	K14*20*12
15	18	14	7.8	12.5	15000	24000	0.005	K15*18*14
	18	16	8	12.9	15000	24000	0.007	K15*18*16
	18	17	8.3	13.7	15000	24000	0.005	K15*18*17
	19	10	7.5	9.8	15000	24000	0.005	K15*19*10

Needle Roller and Cage Assemblies

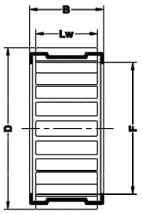
d15 - 20mm



Boundary Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
F mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
15	19	13	9.15	12.7	15000	24000	0.007	K15*19*13
	19	14	10.2	14.6	15000	24000	0.007	K15*19*14
	20	13	9.5	11.6	16000	26000	0.011	K15*20*13
	21	15	12.7	15	16000	26000	0.014	K15*21*15
	21	21	16.8	20.8	16000	26000	0.018	K/15*21*21
16	20	8	6.1	7.65	15000	24000	0.005	K16*20*8
	20	10	7.35	9.8	15000	24000	0.006	K16*20*10
	20	13	9.5	13.7	15000	24000	0.007	K16*20*13
	20	14	10.2	15	15000	24000	0.008	K16*20*14
	20	17	11.2	17	15000	24000	0.008	K16*20*17
	20	20	12.7	19.6	15000	24000	0.010	K16*20*20
	22	12	11	12.5	16000	26000	0.012	K16*22*12
	22	20	17.6	23.2	16000	26000	0.021	K16*22*20
	24	20	19.3	21.6	16000	26000	0.031	K16*24*20
17	20	10	5.7	8.8	15000	24000	0.005	K17*20*10
	21	10	7.65	10.6	15000	24000	0.005	K17*21*10
	21	13	10	14.6	15000	24000	0.008	K17*21*13
	21	15	10.8	16.3	15000	24000	0.009	K17*21*15
	21	17	11.2	17	15000	24000	0.012	K17*21*17
	22	20	16.3	23.6	15000	24000	0.018	K17*22*20
	23	15	13.4	16.6	15000	24000	0.017	K17*23*15
18	22	10	8	11.2	15000	24000	0.006	K18*22*10
	22	13	10.2	15.6	15000	24000	0.008	K18*22*13
	22	14	11	17	15000	24000	0.009	K18*22*14
	22	17	12.5	20	15000	24000	0.010	K18*22*17
	22	20	14.3	23.6	15000	24000	0.014	K18*22*20
	23	20	17	25.5	15000	24000	0.019	K18*23*20
	24	12	11.2	13.4	15000	24000	0.013	K18*24*12
	24	13	11.6	13.7	15000	24000	0.016	K18*24*13
	24	20	18.3	25	15000	24000	0.020	K18*24*20
	25	22	22	29	15000	24000	0.028	K18*25*22
	26	20	20.8	24.5	15000	24000	0.034	K18*26*20
19	23	13	10.2	15.6	14000	22000	0.008	K19*23*13
	23	17	12.7	20.8	14000	22000	0.013	K19*23*17
20	24	8	6.95	98	13000	20000	0.006	K20*24*8
	24	10	8.5	12.7	13000	20000	0.007	K20*24*10
	24	12	10.2	16	13000	20000	0.008	K20*24*12

Needle Roller and Cage Assemblies

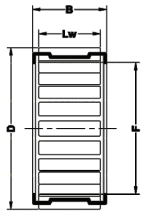
d20 - 25mm



Boundary Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
F mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
20	24	13	11	17.3	13000	20000	0.009	K20*24*13
	24	14	11.8	19	13000	20000	0.009	K20*24*14
	24	17	14	24	13000	20000	0.011	K20*24*17
	26	12	12.5	15.6	13000	20000	0.014	K20*26*12
	26	13	12.7	16	13000	20000	0.015	K20*26*13
	26	17	18.6	26.5	13000	20000	0.019	K20*26*17
	26	20	19.3	27.5	13000	20000	0.022	K20*26*20
	28	20	23.2	29	13000	20000	0.032	K20*28*20
	28	20	23.2	29	13000	20000	0.032	K20*28*20
	19	17	11.6	17.3	15000	24000	0.009	K15*19*17
	28	25	28	37.5	13000	20000	0.039	K20*28*25
	30	30	34.5	42.5	13000	20000	0.059	K20*30*30
21	25	17	13.7	23.2	13000	20000	0.014	K21*25*17
22	26	10	86.5	13.4	12000	19000	0.006	K22*26*10
	26	13	11.2	18.6	12000	19000	0.010	K22*26*13
	26	14	12.5	21.2	12000	19000	0.010	K22*26*14
	26	17	14.6	26.5	12000	19000	0.012	K22*26*17
	26	18	14.6	25.5	12000	19000	0.013	K22*26*18
	27	17	15.6	24	12000	19000	0.016	K22*27*17
	28	13	14	18.6	12000	19000	0.017	K22*28*13
	28	17	17.3	24.5	12000	19000	0.021	K22*28*17
	30	15	18.6	22.8	12000	19000	0.027	K22*30*15
	32	28	37.5	48	12000	19000	0.072	K22*32*28
	32	30	39	51	12000	19000	0.064	K22*32*30
23	28	24	21.2	36.5	11000	18000	0.028	K23*28*24
24	28	10	88	14	10000	17000	0.008	K24*28*10
	28	13	11.8	20.4	10000	17000	0.010	K24*28*13
	28	16	12	20.4	10000	17000	0.015	K24*28*16
	28	17	14.6	26.5	10000	17000	0.012	K24*28*17
	30	17	18.6	28	10000	17000	0.023	K24*30*17
	30	22	22	34.5	10000	17000	0.030	K24*30*22
25	29	10	91.5	15	10000	17000	0.008	K25*29*10
	29	13	10	18.6	10000	17000	0.014	K25*29*13
	29	17	14.3	26.5	10000	17000	0.017	K25*29*17
	30	13	14	22	10000	17000	0.014	K25*30*13
	30	17	18	30.5	10000	17000	0.019	K25*30*17
	30	18	19.6	34	10000	17000	0.020	K25*30*18

Needle Roller and Cage Assemblies

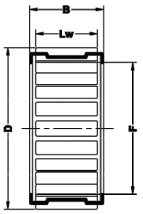
d25 - 30mm



Boundary Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
F mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
25	30	20	20	34.5	10000	17000	0.022	K25*30*20
	30	24	23.6	43	10000	17000	0.025	K25*30*24
	31	14	16	23.2	10000	17000	0.019	K25*31*14
	31	17	18.6	28	10000	17000	0.023	K25*31*17
	31	21	23.6	38	10000	17000	0.029	K25*31*21
	31	24	24	39	10000	17000	0.038	K25*31*24
	32	15	18.3	25	10000	17000	0.028	K25*32*15
	32	16	19	26	10000	17000	0.027	K25*32*16
	33	20	275	38	10000	17000	0.039	K25*33*20
	33	25	31	45	10000	17000	0.046	K25*33*25
	35	25	35.5	46.5	10000	17000	0.059	K25*35*25
	35	30	42.5	57	10000	17000	0.070	K25*35*30
26	30	13	11.6	20.4	9500	16000	0.013	K26*30*13
	30	17	14.3	26.5	9500	16000	0.017	K26*30*17
	31	20	19	32.5	9500	16000	0.026	K26*31*20
27	34	17	19.3	27	9000	15000	0.035	K27*34*17
28	32	21	17.6	36	9000	15000	0.022	K28*32*21
	33	17	19	33.5	9000	15000	0.020	K28*33*17
	33	27	27.5	54	9000	15000	0.031	K28*33*27
	34	17	20	32	9000	15000	0.026	K28*34*17
	34	20	23.2	38	9000	15000	0.024	K28*34*20
	35	16	20	28.5	9000	15000	0.034	K28*35*16
	35	17	20	28.5	9000	15000	0.036	K28*35*17
	35	18	23.2	34.5	9000	15000	0.033	K28*35*18
	35	27	33.5	55	9000	15000	0.047	K28*35*27
	36	20	26.5	37.5	9000	15000	0.049	K28*36*20
	40	30	51	68	9000	15000	0.097	K28*40*30
29	34	27	27.5	55	8500	14000	0.039	K29*34*27
30	35	13	15	25.5	8500	14000	0.017	K30*35*13
	35	17	19.3	35.5	8500	14000	0.022	K30*35*17
	35	18	20.4	37.5	8500	14000	0.023	K30*35*18
	35	20	21.6	43	8500	14000	0.025	K30*35*20
	35	23	24.5	47.5	8500	14000	0.034	K30*35*23
	35	24	26	52	8500	14000	0.030	K30*35*24
	35	27	29	60	8500	14000	0.033	K30*35*27
	36	14	17	26.5	8500	14000	0.023	K30*36*14
	37	18	23.2	35.5	8500	14000	0.040	K30*37*18

Needle Roller and Cage Assemblies

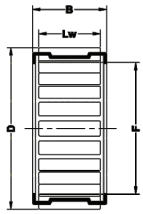
d30 - 38mm



Boundary Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
F mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
30	40	30	44	64	8500	14000	0.081	K30*40*30
	42	30	51	68	8500	14000	0.096	K30*42*30
32	36	15	11	20.4	8000	13000	0.019	K32*36*15
	37	13	14.6	25	8000	13000	0.021	K32*37*13
	37	17	19	35.5	8000	13000	0.022	K32*37*17
	37	27	28	57	8000	13000	0.042	K32*37*27
	38	20	26	48.5	8000	13000	0.039	K32*38*20
	38	26	31.5	58.8	8000	13000	0.043	K32*38*26
	39	14	20	30	8000	13000	0.033	K32*39*14
	39	16	21.2	32.5	8000	13000	0.038	K32*39*16
	39	18	24.5	39	8000	13000	0.037	K32*39*18
	40	25	36	57	8000	13000	0.057	K32*40*25
	40	36	49	86.5	8000	13000	0.080	K32*40*36
	42	42	65.5	10.8	8000	13000	0.119	K32*42*42
34	44	26	40.5	58.5	7500	12000	0.085	K32*42*26
35	40	13	15.6	28	7500	12000	0.019	K35*40*13
	40	17	20	39	7500	12000	0.026	K35*40*17
	40	19	22	44	7500	12000	0.032	K35*40*19
	40	25	27	57	7500	12000	0.034	K35*40*25
	40	27	28.5	60	7500	12000	0.036	K35*40*27
	40	31	32	69.5	7500	12000	0.041	K35*40*31
	42	16	23.6	37.5	7500	12000	0.036	K35*42*16
	42	18	26	43	7500	12000	0.040	K35*42*18
	42	30	38	71	7500	12000	0.062	K35*42*30
	45	20	35.5	50	7500	12000	0.077	K35*45*20
	45	41	67	11.4	7500	12000	0.13	K35*45*41
	45	49	78	13.7	7500	12000	0.147	K35*45*49
36	40	29	20.4	47.5	7500	12000	0.02	K36*40*29
	42	16	21.6	38	7500	12000	0.03	K36*42*16
37	42	13	16.3	30	7000	11000	0.02	K37*42*13
	42	17	20.8	41.5	7000	11000	0.026	K37*42*17
	42	27	30.5	68	7000	11000	0.048	K37*42*27
	44	19	28.5	49	7000	11000	0.044	K37*42*19
38	43	17	20.8	41.5	7000	11000	0.032	K38*43*17
	43	27	30.5	68	7000	11000	0.05	K38*43*27
	46	20	31.5	52	7000	11000	0.056	K38*46*20
	46	32	52	98	7000	11000	0.09	K38*46*32
	50	33	64	98	7000	11000	0.132	K38*50*33

Needle Roller and Cage Assemblies

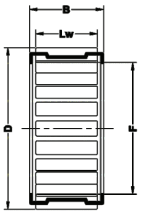
d39 - 47mm



Boundary Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
F mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
39	44	24	29	64	7000	11000	0.037	K39*44*24
40	45	17	22.8	48	6700	10000	0.024	K40*45*17
	45	18	24	51	6700	10000	0.03	K40*45*18
	45	21	22	45.5	6700	10000	0.031	K40*45*21
	45	27	31	71	6700	10000	0.041	K40*45*27
	46	17	24	45	6700	10000	0.035	K40*46*17
	47	18	27	46.5	6700	10000	0.047	K40*47*18
	48	20	31	51	6700	10000	0.06	K40*48*20
	50	27	50	81.5	6700	10000	0.094	K40*50*27
	55	45	96.5	146	6700	10000	0.237	K40*55*45
42	47	13	18	35.5	6700	10000	0.023	K42*47*13
	47	17	21.6	45.5	6700	10000	0.035	K42*47*17
	47	27	32	75	6700	10000	0.054	K42*47*27
	50	13	21.2	30	6700	10000	0.041	K42*50*13
	50	18	30	50	6700	10000	0.053	K42*50*18
	50	20	32	54	6700	10000	0.062	K42*50*20
43	48	17	21.6	46.5	6300	9500	0.036	K43*48*17
	48	27	32	75	6300	9500	0.045	K43*48*27
44	50	22	30	61	6300	9500	0.046	K44*50*22
45	50	13	17.6	36	6300	9500	0.024	K45*50*13
	50	17	23.6	53	6300	9500	0.032	K45*50*17
	50	21	23.2	51	6300	9500	0.034	K45*50*21
	50	27	32.5	78	6300	9500	0.058	K45*50*27
	52	18	29	53	6300	9500	0.052	K45*52*18
	52	21	33.5	64	6300	9500	0.067	K45*52*21
	53	20	34	60	6300	9500	0.065	K45*53*20
	53	21	37.5	67	6300	9500	0.069	K45*53*21
	53	25	40.5	75	6300	9500	0.094	K45*53*25
	53	28	46.5	90	6300	9500	0.088	K45*53*28
	55	20	40	62	6300	9500	0.077	K45*55*20
	59	18	46.5	56	6300	9500	0.079	K45*59*18TN
	59	36	78	118	6300	9500	0.0186	K45*59*36
	60	40	88	134	6300	9500	0.305	K45*60*40
	60	45	98	153	6300	9500	0.342	K45*60*45
47	52	17	23.2	51	6000	9000	0.034	K47*52*17
	52	27	33.5	83	6000	9000	0.049	K47*52*27
	55	26	43	83	6000	9000	0.101	K47*55*26

Needle Roller and Cage Assemblies

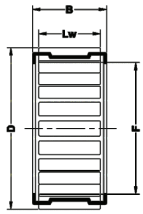
d47 - 65mm



Boundary Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
F mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
47	55	28	46.5	90	6000	9000	0.092	K47*55*28
48	53	17	24.5	56	5600	8500	0.033	K48*53*17
	54	19	29	62	5600	8500	0.047	K48*54*19
49	65	38	93	140	5600	8500	0.249	K49*55*36
50	55	17	24	56	5600	8500	0.034	K50*55*17
	55	20	28.5	69.5	5600	8500	0.04	K50*55*20
	55	30	36	93	5600	8500	0.071	K50*55*30
	56	23	33.5	75	5600	8500	0.056	K50*56*23
	58	20	36.5	68	5600	8500	0.072	K50*58*20
	58	25	44	86.5	5600	8500	0.087	K50*58*25
	58	35	61	132	5600	8500	0.105	K50*58*35
	60	32	58.5	106	5600	8500	0.172	K50*60*32
52	57	12	15.6	31.5	5300	8000	0.03	K52*57*12
	57	14	20.4	45	5300	8000	0.043	K52*57*17
	60	24	45	90	5300	8000	0.088	K52*60*24
55	60	17	24.5	60	5000	7500	0.045	K55*60*17
	60	20	29	73.5	5000	7500	0.043	K55*60*20
	60	27	38	102	5000	7500	0.062	K55*60*27
	60	30	38	104	5000	7500	0.078	K55*60*30
	63	15	29	52	5000	7500	0.068	K55*63*15
	63	20	38	75	5000	7500	0.078	K55*63*20
	63	25	47.5	98	5000	7500	0.095	K55*63*25
	63	32	57	125	5000	7500	0.143	K55*63*32
	65	36	75	150	5000	7500	0.206	K55*65*36
58	63	17	26	64	4800	7000	0.048	K58*63*17
	65	18	32.5	68	4800	7000	0.065	K58*65*18
60	65	20	30.5	80	4800	7000	0.046	K60*65*20
	65	30	40.5	116	4800	7000	0.085	K60*65*30
	68	20	40	80	4800	7000	0.084	K60*68*20
	68	23	46.5	98	4800	7000	0.112	K60*68*23
	68	25	49	104	4800	7000	0.123	K60*68*25
	75	42	11.2	196	4800	7000	0.408	K60*75*42
63	71	20	39	80	4500	6700	0.09	K63*71*20
64	70	16	25	56	4500	6700	0.061	K64*70*16
65	70	20	27	69.5	4300	6300	0.054	K65*70*20
	70	30	42.5	125	4300	6300	0.092	K65*70*30
	73	30	57	129	4300	6300	0.0131	K65*73*30

Needle Roller and Cage Assemblies

d68 - 165mm



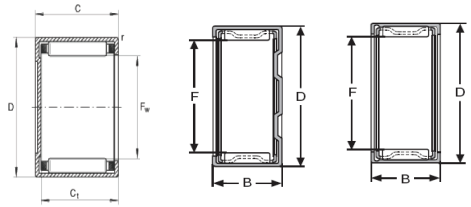
Boundary Dimension			Basic Load Rating		Speed Rating Lubrication		Mass	Designation
F mm	D	B	Dynamic C kN	Static C0	Grease RPM	Oil	Kg.	
68	74	28	42.5	110	4000	6000	0.081	K68*74*28
	74	30	45	120	4000	6000	0.098	K68*74*30
70	76	20	34	85	4000	6000	0.082	K70*76*20
	76	30	49	134	4000	6000	0.121	K70*76*30
	78	20	41.5	90	4000	6000	0.099	K70*78*20
	78	23	47.5	106	4000	6000	0.0128	K70*78*23
	78	30	58.5	140	4000	6000	0.14	K70*78*30
72	80	20	42.5	91.5	4000	6000	0.101	K73*80*20
73	79	20	35.5	90	3800	5600	0.086	K73*79*20
75	83	23	50	116	3800	5600	0.12	K75*83*23
	83	30	57	140	3800	5600	0.181	K75*83*20
80	86	20	36.5	98	3600	5300	0.094	K80*86*20
	88	25	51	122	3600	5300	0.161	K80*88*25
	88	30	64	163	3600	5300	0.16	K80*88*30
85	92	20	38	93	3400	5000	0.096	K85*92*20
	93	25	53	129	3400	5000	0.17	K85*93*20
	93	30	65.5	173	3400	5000	0.169	K85*93*30
90	97	20	42	116	3000	4500	0.107	K90*97*20
	98	25	52	129	3000	4500	0.179	K90*98*25
	98	30	60	156	3000	4500	0.215	K90*98*30
95	103	20	46.5	116	2800	4300	0.152	K95*103*20
100	108	30	68	193	2800	4300	0.239	K100*108*30
105	113	27	64	180	2600	4000	0.225	K105*113*27
110	118	24	61	170	2400	3800	0.208	K110*118*24
	118	30	71	208	2400	3800	0.262	K110*118*30
120	128	25	63	183	2000	3400	0.237	K120*128*25
130	137	24	61	200	1900	3200	0.211	K130*137*24
	140	45	127	400	1900	3200	0.586	K130*140*45
135	145	38	116	355	1800	3000	0.511	K135*145*38
140	150	43	132	430	1800	3000	0.596	K140*150*43
150	160	43	137	455	1700	2800	0.639	K150*160*43
160	168	22	62	200	1600	2600	0.281	K160*168*22
165	173	26	75	255	1600	2600	0.338	K165*173*26

Drawn Cup Needle Roller Bearings With Open Ends

Series HK

Drawn Cup Needle Roller Bearings With Closed Ends

Series BK



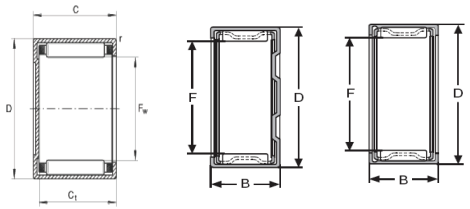
Drawn cup needle rolller bearings with open ends		Drawn cup needle rolller bearings with closed ends		Dimensions			Basic load ratings		Limiting speed	Reference speed
				Fw	D	C	dynamic C	static C_0	n_G	n_B
Designation	Mass = g	Designation	Mass = g			-0.3	kN	kN	min^{-1}	min^{-1}
(+) HK 0306 TN	1	(+) BK 0306 TN[2])	1	3	6.5	6	1.23	0.84	32200	45500
(+) HK 0408	2	(+) BK 0408	2.1	4	8	8	1.78	1.31	28700	35000
(+) HK 0509	2	(+) BK 0509	2.1	5	9	9	2.4	1.99	26600	29400
(+) HK 0608	2.1	-	-	6	10	8	2.03	1.65	24500	25200
HK 0609	2.5	BK 0609	2.6	6	10	9	2.85	2.6	24500	24500
HK 0709	2.6	BK 0709	2.9	7	11	9	3.1	2.95	21700	21700
HK 0808	2.7	BK 0808	3	8	12	8	2.75	2.6	19600	18900
HK 0810	3	BK 0810	3.4	8	12	10	3.8	3.95	19600	18900
HK 0908	3	-	-	9	13	8	3.55	3.75	17500	16100
HK 0910	4	BK 0910	4.3	9	13	10	4.25	4.65	17500	16800
HK 0912	4.6	BK 0912	4.9	9	13	12	5.3	6.3	17500	16100
HK 1010	4.1	BK 1010	4.3	10	14	10	4.4	5.1	16100	15400
HK 1012	4.8	BK 1012	5	10	14	12	5.5	6.8	16100	14700
HK 1015	6	BK 1015	6.2	10	14	15	6.8	8.8	14000	14700
HK 1210	4.6	BK 1210	5.2	12	16	10	4.95	6.2	13300	12600
HK 1212	9	BK 1212	10	12	18	12	6.5	7.3	12600	12600
HK 1312	10	BK 1312	11	13	19	12	6.8	7.9	11200	11900
HK 1412	10.5	BK 1412	12	14	20	12	7.1	8.5	11200	11200
HK 1512	11	BK 1512	13	15	21	12	7.9	9.4	11200	9800
HK 1516	15	BK 1516	17	15	21	16	10.5	14.4	11200	9800
(°)HK 1522	20	-	-	15	21	22	13.4	19.5	11200	9800
HK 1612	12	BK 1612	14	16	22	12	7.6	9.7	10500	9800
HK 1616	16	BK 1616	18	16	22	16	10.9	15.3	10500	9100
(°)HK 1622	22	BK 1622	24	16	22	22	13.1	19.4	10500	9800
HK 1712	12	-	-	17	23	12	7.9	10.3	9800	9100
HK 1812	13	BK 1812	15	18	24	12	8.1	10.9	9100	8400
HK 1816	18	BK 1816	20	18	24	16	11.6	17.3	9100	8400
HK 2010	12	-	-	20	26	10	6.4	8.2	8400	8400
HK 2012	14	-	-	20	26	12	8.6	12.1	8400	7700
HK 2016	19	BK 2016	22	20	26	16	12.7	20.1	8400	7700
HK 2020	24	BK 2020	27	20	26	20	15.7	26	8400	7700
(°)HK 2030	35	-	-	20	26	30	21.8	40	8400	7700
HK 2210	13	-	-	22	28	10	7.5	10.5	7700	7000
HK 2212	15	BK 2212	18	22	28	12	9.1	13.4	7700	7000

Drawn Cup Needle Roller Bearings With Open Ends

Series HK

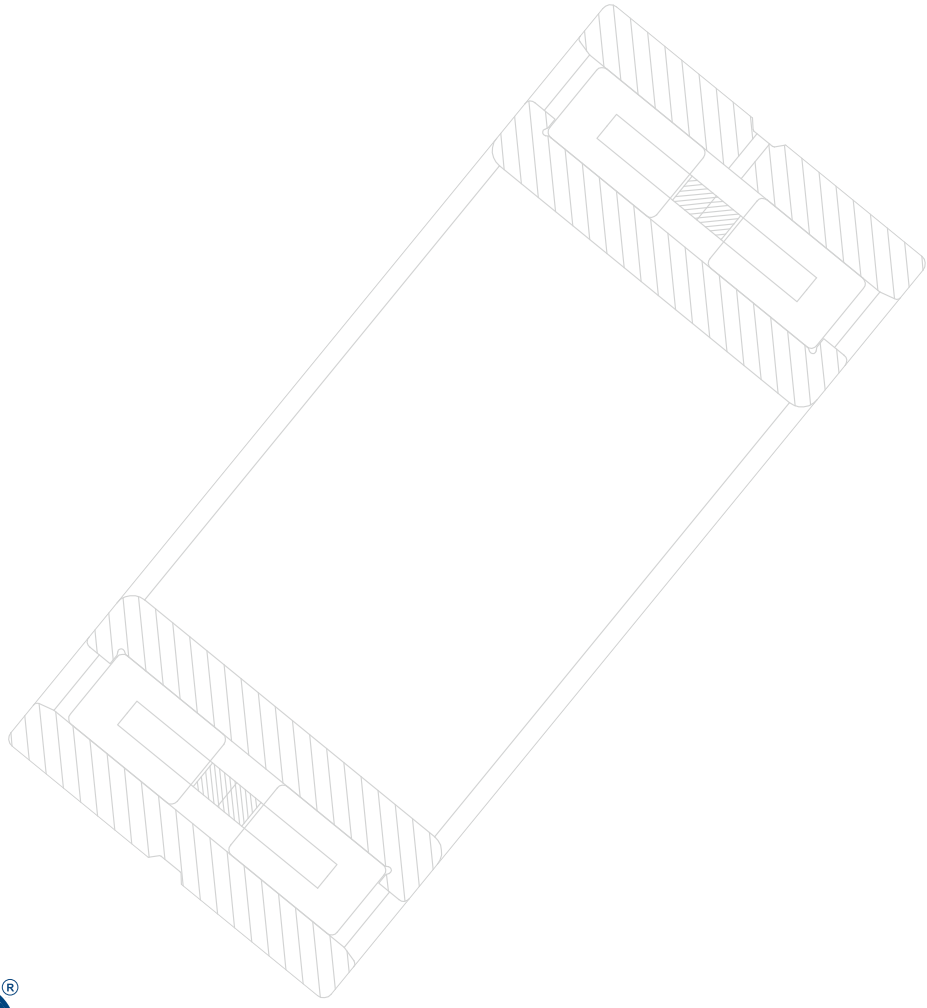
Drawn Cup Needle Roller Bearings With Closed Ends

Series BK



Drawn cup needle rolller bearings with open ends		Drawn cup needle rolller bearings with closed ends		Dimensions			Basic load ratings		Limiting speed	Reference speed
				Fw	D	C	dynamic C	static C_0	n_G	n_B
Designation	Mass = g	Designation	Mass = g			-0.3	kN	kN	min $^{-1}$	min $^{-1}$
HK 2216	21	BK 2216	24	22	28	16	13.4	22.1	7700	7000
HK 2220	26	-	-	22	28	20	16.5	29	7700	7000

TN = Plastic cage, permissible operating temperature : + 120 ˚C (Continuous operation).
(+) Not available with lubrication hole.
(°) Double row version with lubrication hole.
1) For other inner rings see
2) BK 0306 TN with smooth base

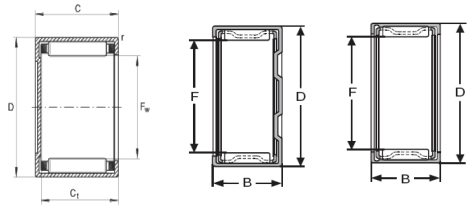


Drawn Cup Needle Roller Bearings With Open Ends

Series HK

Drawn Cup Needle Roller Bearings With Closed Ends

Series BK



Drawn cup needle rolller bearings with open ends		Drawn cup needle rolller bearings with closed ends		Dimensions			Basic load ratings		Limiting speed	Reference speed
							dynamic	static		
Designation	Mass = g	Designation	Mass = g	Fw	D	C -0.3	C kN	C_0 kN	n_G min^{-1}	n_B min^{-1}
HK 2512	20	-	-	25	32	12	11	15.2	7000	6300
HK 2516	27	-	-	25	32	16	15.6	24	7000	6300
HK 2520	33	BK 2520	38	25	32	20	19.9	33	7000	5950
HK 2526	44	BK 2526	48	25	32	26	25.5	45	7000	5950
(°) HK 2538	64	(°) BK 2538	68	25	32	38	34	66	7000	5950
HK 2816	29	-	-	28	35	16	16.4	26.5	6300	5600
HK 2820	36	-	-	28	35	20	20.9	36	6300	5600
HK 3012	23	BK 3012	28	30	37	12	12.1	18.2	5950	5250
HK 3016	31	BK 3016	38	30	37	16	17.2	29	5950	5250
HK 3020	39	BK 3020	47	30	37	20	22	39.5	5950	5250
HK 3026	51	BK 3026	58	30	37	26	28	54	5950	5250
(°) HK 3038	76	(°) BK 3038	84	30	37	38	37.5	79	5950	5250
HK 3512	27	-	-	35	42	12	13.1	21.3	5250	4550
HK 3516	36	-	-	35	42	16	18.7	33.5	5250	4550
HK 3520	44	BK 3520	53	35	42	20	23.8	46	5250	4550
HK 4012	30	-	-	40	47	12	14	24.3	4550	4200
HK 4016	39	-	-	40	47	16	20	38.5	4550	4200
HK 4020	54	BK 4020	62	40	47	20	25.5	52	4550	3850
HK 4512	33	-	-	45	52	12	14.9	27.5	4200	3850
HK 4516	46	-	-	45	52	16	21.3	43	4200	3850
HK 4520	56	BK 4520	72	45	52	20	27	59	4200	3500
HK 5020	70	-	-	50	58	20	31	63	3500	3290
HK 5025	90	-	-	50	58	25	38.5	84	3500	3290
HK 5520	74	-	-	55	63	20	31.5	67	3290	3080
HK 5528	105	-	-	55	63	28	44	103	3290	3010
HK 6012	49	-	-	60	68	12	17.4	32	3080	3010
HK 6020	81	-	-	60	68	20	33.5	75	3080	2870
HK 6032	136	-	-	60	68	32	53	135	3080	2800

TN = Plastic cage, permissible operating temperature : + 120 °C (Continuous operation).
(0) Double row version with lubrication hole.

Pillow Block
Bearings

UC Series

These bearings are combination of radial ball bearing, seal and housing of high grade cast iron which comes in various shapes. The OD of the bearing and the internal surface of housing arespherical, because of this the unit is self aligning.

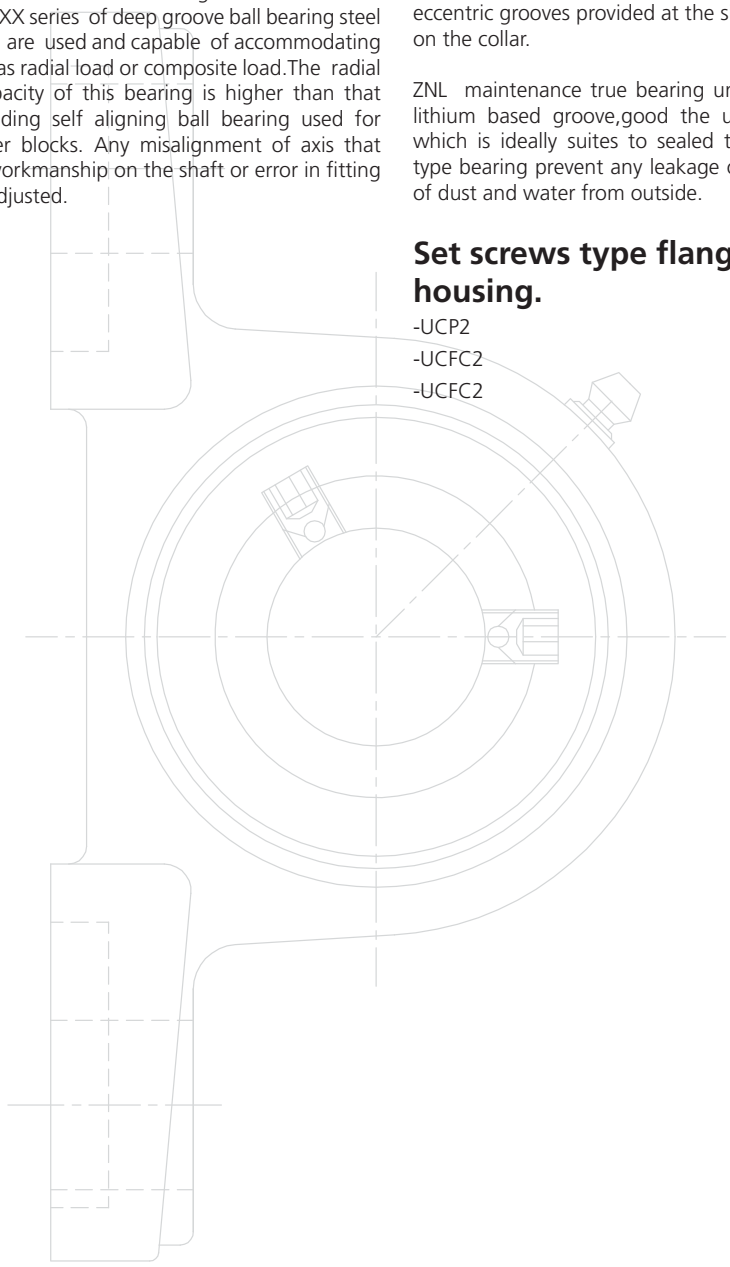
The internal construction of ball bearing for the unit is such that 62XX and 63XX series of deep groove ball bearing steel ball and retainer's are used and capable of accommodating axial load as well as radial load or composite load.The radial load carrying capacity of this bearing is higher than that of the corresponding self aligning ball bearing used for standard plummer blocks. Any misalignment of axis that aries from poor workmanship on the shaft or error in fitting will be properly adjusted.

Depending on the type, the following method of fitting to the shaft are employed.
(A) The inner ring is the fastened onto the shaft in two places by set screws.
(B) The inner ring has a tapered bore and is fitted to the shaft by means of an adopter.
(C) In the eccentric locking collar system the inner ring is fastened to the shaft by means of
eccentric grooves provided at the side of the inner ring and on the collar.

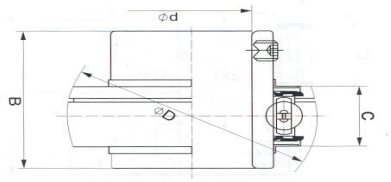
ZNL maintenance true bearing unit contain a high grade lithium based groove,good the use over a long period, which is ideally suites to sealed type bearing. Alsosealed type bearing prevent any leakage of groove or penetration of dust and water from outside.

Set screws type flanged units cost housing.

-UCP2
-UCFC2
-UCFC2

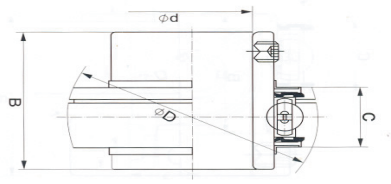


UC 2XX



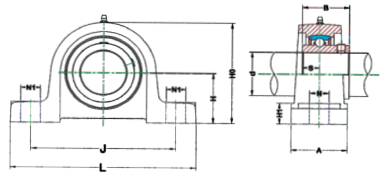
Dimensions in mm					Basic Load Ratings		Wt. (Kg)
Bearing No.	d	D	B	C	Dynamic N	Static	
UC201	12.000	47.000	31.000	17.000	9880	6200	0.200
UC202	15.000	40.000	27.400	14.000	9550	4780	0.120
UC203	17.000	40.000	27.400	14.000	9550	4780	0.110
UC204	20.000	47.000	31.000	16.000	12800	6650	0.180
UC205	25.000	52.000	34.000	17.000	14000	7880	0.210
UC206	30.000	62.000	38.100	19.000	19500	11200	0.340
UC207	35.000	72.000	42.900	20.000	25700	15200	0.530
UC208	40.000	80.000	49.200	21.000	29600	18200	0.640
UC209	45.000	85.000	49.200	22.000	31850	20800	0.680
UC210	50.000	90.000	51.600	23.000	35100	23200	0.800
UC211	55.000	100.000	55.600	25.000	43550	29200	1.110
UC212	60.000	110.000	65.100	27.000	47800	32800	1.530
UC213	65.000	120.000	65.100	28.000	57200	40000	1.860
UC214	70.000	125.000	74.600	30.000	60800	45000	2.050
UC215	75.000	130.000	77.800	30.000	66000	49500	2.210
UC216	80.000	140.000	82.600	33.000	71500	54200	2.790
UC217	85.000	150.000	85.700	34.000	83200	63800	3.380
UC218	90.000	160.000	96.000	37.000	95900	71500	4.450

UC 3XX



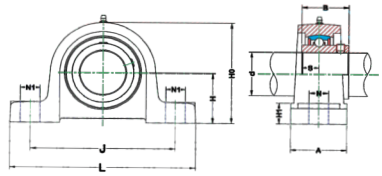
Dimensions in mm					Basic Load Ratings		Wt. (Kg)
Bearing No.	d	D	B	C	Dynamic N	Static	
UC305	25.000	62.000	38.000	21.000	22360	11500	0.350
UC306	30.000	72.000	43.000	24.000	27000	15200	0.560
UC307	35.000	80.000	48.000	25.000	33500	19200	0.710
UC308	40.000	90.000	52.000	28.000	40560	24000	0.960
UC309	45.000	100.000	57.000	30.000	53000	31800	1.280
UC310	50.000	110.000	61.000	32.000	61750	37800	1.650
UC311	55.000	120.000	66.000	34.000	71500	44800	1.900
UC312	60.000	130.000	71.000	36.000	81600	51800	2.600
UC313	65.000	140.000	75.000	38.000	93860	60500	3.250
UC314	70.000	150.000	78.000	40.000	104260	68000	3.960
UC315	75.000	160.000	82.000	42.000	113360	76800	4.330
UC316	80.000	170.000	86.000	44.000	122850	86500	5.570
UC317	85.000	180.000	96.000	46.000	132600	96500	6.840
UC318	90.000	190.000	96.000	48.000	14300	10800	7.870
UC319	95.000	200.000	103.000	50.000	156000	122000	8.880

UCP 2XX



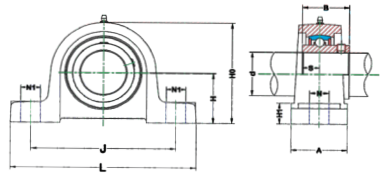
Unit No.	Shaft Dia.		Dimension										Bolt Size	Weight
	d (In)	mm	H	L	J	A	N	N1	H1	H0	B	S	mm	Kg.
UCP201		12	30.2	127	95	38	13	19	14	60.7	31	12.7	M10	0.76
UCP201-8	1/2													
UCP202-9	9/16		30.2	125	96	32	12	16	13	57	27.4	11.5	M10	0.6
UCP202-9		15												
UCP202-10	5/8													
UCP203		17	30.2	125	96	32	12	16	13	57	27.4	11.5	M10	0.6
UCP203-11	11/16													
UCP204-12			33.3	127	96	37	13	19	14	63.8	31	12.7	M10	0.65
UCP204		20												
UCP205-14	7/8													
UCP205-15	15/16		36.5	140	105	38	13	19	15	69.5	34	14.3	M10	0.72
UCP205		25												
UCP205-16	1													
UCP206-17	1-11/16		42.9	160	121	44	14	19	16	82	38.1	15.9	M12	1.15
UCP206-18	1-1/8													
UCP206		30												
UCP206-19	1-3/16													
UCP206-20	1-1/4													
UCP207-20	1-1/4		47.6	167	126	48	15	19	17	92	42.9	17.5	M12	1.53
UCP207-21	1-5/16													
UCP207-22	1-3/8													
UCP207		35												
UCP207-23	1-7/16													
UCP208-24	1-1/2		49.2	180	136	52	15	21	18	98	49.2	19	M12	1.88
UCP208-25	1-9/16													
UCP208		40												
UCP209-26	1-5/8		54	189	146	54	15	21	20	105.5	49.2	19	M12	2.1
UCP209-27	1-11/16													
UCP209-28	1-3/4													
UCP209		45												

UCP 2XX



Unit No.	Shaft Dia.		Dimension										Bolt Size	Weight
	d (In)	mm	H	L	J	A	N	N1	H1	H0	B	S	mm	Kg.
UCP210-30	1-7/8		57.2	204	159	57	19	22	21	112.2	51.6	19	M16	2.50
UCP210-31	1-15/16													
UCP210		50												
UCP210-32	2													
UCP211-32	2		63.5	217	172	60	19	22	22	124.5	55.6	22.2	M16	3.30
UCP211-34	2-1/8													
UCP211		55												
UCP211-35	2-3/16													
UCP212-36	2-1/4		69.9	238	186	66	19	25	24	137	65.1	25.4	M16	5.50
UCP212		60												
UCP212-38	2-3/8													
UCP212-39	2-7/16													
UCP213-40	2-1/2		76.2	262	203	70	23	29	26	149	65.1	25.4	M20	5.60
UCP213		65												
UCP214-44	2-3/4		79.4	266	210	72	23	29	27	155	74.6	30.2	M20	6.60
UCP214		70												
UCP215-47	2-15/16		82.6	274	217	74	25	29	28	161.6	77.8	33.3	M20	7.30
UCP215		75												
UCP215-48	3													
UCP216		80	88.9	292	332	78	25	30	30	174	82.6	33.3	M20	8.30
UCP217-52	3-1/4		95.2	310	247	83	25	30	32	186	85.7	34.1	M20	10.80
UCP217		85												
UCP218-56	3-1/2		101.6	326	262	88	27	30	33	198	96	39.7	M22	13.00
UCP218		90												
UCP220		100	115	380	305	95	30	36	40	225	108	42	M20	16.00

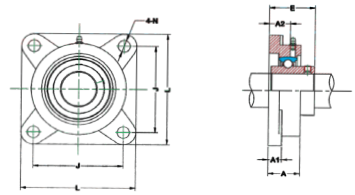
UCP 3XX



Unit No.	Shaft	Dimension										Bolt Size	Weight
	d mm	H	L	J	A	N	N1	H1	H0	B	S	mm	Kg.
UCP305	25	45	173	132	45	17	20	15	85	38	15	M14	1.40
UCP306	30	50	180	140	50	17	20	15	95	43	17	M14	1.80
UCP307	35	56	210	160	56	17	25	19	106	48	19	M14	2.80
UCP308	40	60	218	170	62	18	25	19	116	52	19	M14	3.00
UCP309	45	67	244	190	66	20	26	23	129	57	22	M16	4.10
UCP310	50	75	271	212	74	20	30	26	143	61	22	M16	5.80
UCP311	55	80	300	236	80	20	32	29	154	66	25	M16	7.40
UCP312	60	85	325	250	85	23	35	31	164	71	26	M20	9.40
UCP313	65	90	335	260	90	25	38	33	176	75	30	M20	10.00
UCP314	70	95	360	280	93	27	40	34	187	78	31	M22	12.00
UCP315	75	100	380	290	100	27	40	35	198	82	32	M22	14.00
UCP316	80	106	400	300	105	27	40	37	210	86	34	M22	18.00
UCP317	85	112	420	320	110	33	45	40	220	96	40	M27	20.00
UCP318	90	118	430	330	110	33	45	40	234	96	40	M27	24.00
UCP319	95	125	470	360	120	36	50	46	248	103	41	M30	29.00
UCP320	100	140	490	380	120	36	50	50	275	108	42	M30	35.00
UCP321	105	140	490	380	120	36	50	50	280	112	44	M30	36.60
UCP322	110	150	520	400	140	40	55	55	300	117	46	M33	42.50
UCP323	120	160	570	450	140	40	55	65	320	126	51	M33	53.50
UCP324	130	180	600	480	140	40	55	75	355	135	54	M33	72.10
UCP328	140	200	620	500	140	40	55	75	390	145	59	M33	89.10

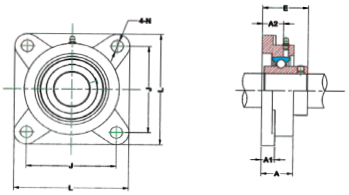
NOTE: All inch Sizes Available.

UCF 2XX



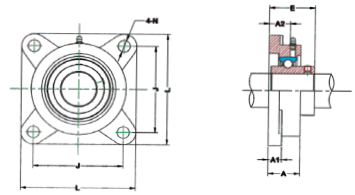
Unit No.	Shaft Dia.	Dimension									Bolt Size	Weight
	d (In)	mm	L	J	A2	A1	A	N	E	S	mm	Kg.
UCF201		12	86	64	15	12	25.5	12	31	12.7	M10	0.61
UCF201-8	1/2											
UCF202-9	9/16		76	54	15	11	24.5	11.5	30.9	11.5	M10	0.57
UCF202		15										
UCF202-10	5/8											
UCF203		17	76	54	15	11	24.5	11.5	30.9	11.5	M10	0.5
UCF203-11	11/16											
UCF204-12	3/4		86	64	15	11	25.5	11.5	33.3	12.7	M10	0.61
UCF204		20										
UCF205-14	7/8		95	70	16	13	27	11.5	35.7	14.3	M10	0.80
UCF205-15	15/16											
UCF205		25										
UCF205-16	1											
UCF206-17	1-11/16		108	83	18	13	31	11.5	40.2	15.9	M10	1.07
UCF206-18	1-1/8											
UCF206		30										
UCF206-19	1-3/16											
UCF206-20	1-1/4											
UCF207-20	1-1/4		117	92	19	15	34	14	44.4	17.5	M12	1.40
UCF207-21	1-5/16											
UCF207-22	1-3/8											
UCF207		35										
UCF207-23	1-7/16											
UCF208-24	1-1/2		130	102	21	15	36	14	51.2	19	M12	1.80
UCF208-25	1-9/16											
UCF208		40										
UCF209-26	1-5/8		137	105	22	16	38	16	52.2	19	M14	2.20
UCF209-27	1-11/16											
UCF209-28	1-3/4											
UCF209		45										

UCF 2XX



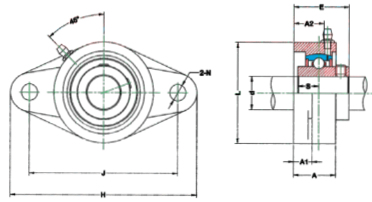
Unit No.	Shaft Dia.	Dimension									Bolt Size	Weight
	d (In)	mm	L	J	A2	A1	A	N	E	S	mm	Kg.
UCF210-30	1-7/8		143	111	22	16	40	18	54.6	19	M16	2.40
UCF210-31	1-15/16											
UCF210		50										
UCF210-32	2											
UCF211-32	2		162	130	25	18	43	18	58.4	22.2	M16	3.50
UCF211-34	2-1/8											
UCF211		55										
UCF211-35	2-3/16											
UCF212-36	2-1/4		175	143	29	18	48	18	68.7	25.4	M16	4.20
UCF212		60										
UCF212-38	2-3/8											
UCF212-39	2-7/16											
UCF213-40	2-1/2		187	149	30	22	50	18	69.7	25.4	M16	5.30
UCF213		65										
UCF214-44	2-3/4		193	152	31	22	54	18	75.4	30.2	M16	5.90
UCF214		70										
UCF215-47	2-15/16		200	159	34	22	56	18	78.5	33.3	M16	6.30
UCF215		75										
UCF215-48	3											
UCF216		80	208	165	34	22	57	22	83.3	33.3	M20	7.30
UCF217-52	3-1/4		220	175	36	24	63	23	87.6	34.1	M20	8.90
UCF217		85										
UCF218-56	3-1/2		235	187	40	25	68	23	96.3	39.7	M20	11.60
UCF218		90										

UCF 3XX



Unit No.	Shaft Dia.	Dimension								Bolt Size	Weight
	d mm	L	J	A2	A1	A	N	E	S	mm	Kg.
UCF305	25	108	80	16	13	29	16	39	15	M14	1.20
UCF306	30	125	95	18	15	32	16	44	17	M14	1.80
UCF307	35	135	100	20	16	36	19	49	19	M16	2.20
UCF308	40	150	112	23	17	40	19	56	19	M16	2.90
UCF309	45	160	125	25	18	44	19	60	22	M16	3.50
UCF310	50	175	132	28	20	48	23	67	22	M20	4.80
UCF311	55	185	140	30	20	52	23	71	25	M20	5.60
UCF312	60	193	150	33	22	56	23	78	26	M20	6.70
UCF313	65	208	166	33	22	58	23	78	30	M20	7.80
UCF314	70	226	178	36	25	61	25	81	31	M22	10.10
UCF315	75	236	184	39	25	66	25	89	32	M22	11.10
UCF316	80	250	196	38	27	68	31	90	34	M27	12.80
UCF317	85	260	204	44	27	74	31	100	40	M27	15.40
UCF318	90	280	216	44	30	76	35	100	40	M30	19.00
UCF319	95	290	228	59	30	94	35	121	41	M30	20.6
UCF320	100	310	242	59	32	94	38	125	42	M33	25.7
UCF321	105	310	242	59	32	94	38	112	44	M33	25.50
UCF322	110	340	266	60	35	96	41	117	46	M36	38
UCF324	120	370	290	65	40	110	41	126	51	M36	50
UCF326	130	410	320	65	45	115	41	135	54	M36	66
UCF328	140	450	350	75	55	125	41	145	59	M36	90

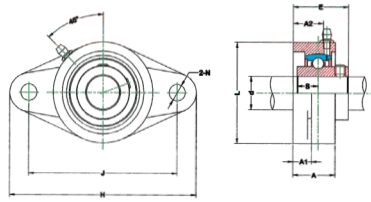
NOTE: All inch Sizes Available.



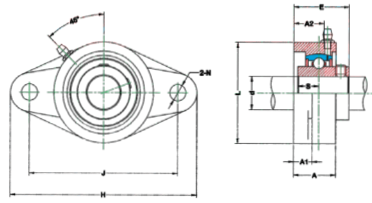
UCFL 2XX

Unit No.	Shaft Dia.		Dimension									Bolt Size	Weight
	d (In)	mm	H	J	A2	A1	A	N	L	E	S	mm	Kg.
UCFL201		12	113	90	15	11	25.5	12	60	31	12.7	M10	0.51
UCFL201-8	1/2												
UCFL202-9	9/16		99	76.5	15	11	24.5	11.5	57	30.9	11.5	M10	0.45
UCFL202		15											
UCFL202-10	5/8												
UCFL203		17	99	76.5	15	11	24.5	11.5	57	30.9	11.5	M10	0.45
UCFL203-11	11/16												
UCFL204-12	3/4		113	90	15	11	25.5	11.5	60	33.3	12.7	M10	0.48
UCFL204		20											
UCFL205-14	7/8		130	99	16	13	27	11.5	68	35.7	14.3	M10	0.6
UCFL205-15	15/16												
UCFL205		25											
UCFL205-16	1												
UCFL206-17	1-11/16		148	117	18	13	31	11.5	80	40.2	15.9	M10	0.9
UCFL206-18	1-1/8												
UCFL206		30											
UCFL206-19	1-3/16												
UCFL206-20	1-1/4												
UCFL207-20	1-1/4		161	130	19	14	34	14	90	44.4	17.5	M12	1.2
UCFL207-21	1-5/16												
UCFL207-22	1-3/8												
UCFL207		35											
UCFL207-23	1-7/16												
UCFL208-24	1-1/2		175	144	21	14	36	14	100	51.2	19	M12	1.5
UCFL208-25	1-9/16												
UCFL208		40											
UCFL209-26	1-5/8		188	148	22	16	38	18	108	52.2	19	M16	1.9
UCFL209-27	1-11/16												
UCFL209-28	1-3/4												
UCFL209		45											

UCFL 2XX



Unit No.	Shaft Dia.		Dimension									Bolt Size	Weight
	d (In)	mm	H	J	A2	A1	A	N	L	E	S	mm	Kg.
UCFL210-30	1-7/8		197	157	22	16	40	18	115	54.6	19	M16	2.2
UCFL210-31	1-15/16												
UCFL210		50											
UCFL210-32	2												
UCFL211-32	2		224	184	25	18	43	18	130	58.4	22.2	M16	3.1
UCFL211-34	2-1/8												
UCFL211		55											
UCFL211-35	2-3/16												
UCFL212-36	2-1/4		250	202	29	18	48	18	140	68.7	25.4	M20	4.0
UCFL212		60											
UCFL212-38	2-3/8												
UCFL212-39	2-7/16												
UCFL213-40	2-1/2		258	210	30	20	50	23	155	69.7	25.4	M20	5.0
UCFL213		65											
UCFL214-44	2-3/4		265	216	31	20	54	23	160	75.4	30.2	M20	5.6
UCFL214		70											
UCFL215-47	2-15/16		275	225	34	22	55	23	164	78.5	33.3	M20	6.2
UCFL215		75											
UCFL215-48	3												
UCFL216		80	290	233	34	22	58	25	180	83.3	33.3	M22	7.3
UCFL217-52	3-1/4		305	248	36	22	63	25	190	87.6	34.1	M22	9.8
UCFL217		85											
UCFL218-56	3-1/2		320	265	40	23	68	25	205	90.3	39.7	M22	12.4
UCFL218		90											

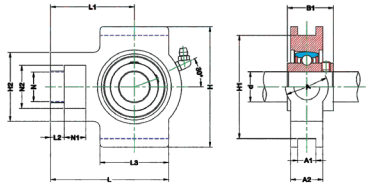


UCFL 3XX

Bearing No.	Shaft Dia.	Dimension									Bolt Size	Weight
	"d mm"	H	J	A2	A1	A	N	L	E	S	mm	Kg.
UCFL305	25	150	113	16	13	29	19	80	39	15	M16	1.10
UCFL306	30	180	134	18	15	32	23	90	44	17	M20	1.50
UCFL307	35	185	141	20	16	36	23	100	49	19	M20	1.80
UCFL308	40	200	158	23	17	40	23	112	56	19	M20	2.50
UCFL309	45	230	177	25	18	44	25	125	60	22	M22	3.40
UCFL310	50	240	187	28	19	48	25	140	67	22	M22	4.40
UCFL311	55	250	198	30	20	52	25	150	71	25	M22	5.10
UCFL312	60	270	212	33	22	56	31	160	78	26	M27	6.10
UCFL313	65	295	240	33	25	58	31	175	78	30	M27	7.80
UCFL314	70	315	250	36	28	61	35	185	83	31	M30	9.08
UCFL315	75	320	260	39	30	66	35	195	89	32	M30	11.30
UCFL316	80	355	285	38	32	68	38	210	90	34	M33	14.30
UCFL317	85	370	300	44	32	74	38	220	100	40	M33	16.00
UCFL318	90	385	315	44	36	76	38	235	100	40	M33	19.10
UCFL319	95	405	330	59	40	94	41	250	121	41	M36	24.60
UCFL320	100	440	360	59	40	94	44	270	125	42	M39	30.80
UCFL321	105	440	360	59	40	94	44	270	112	44	M39	28.20
UCFL322	110	470	390	60	42	96	44	300	117	46	M39	33.10
UCFL324	120	520	430	65	48	110	47	330	128	51	M42	45.70
UCFL326	130	550	460	65	50	115	47	360	135	54	M42	57.50
UCFL328	140	600	500	75	60	125	51	400	145	59	M45	79.70

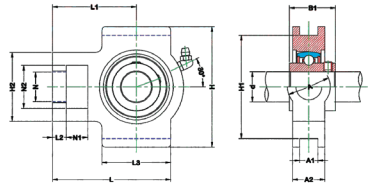
NOTE: All inch Sizes Available.

UCT 2XX



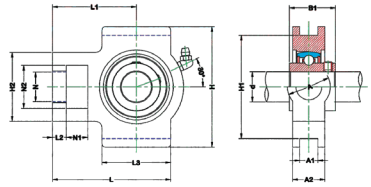
Unit No.	Shaft Dia.	Dimension																Weight
	d In	mm	N1	L2	H2	N2	N	L3	A1	H1	H	L	A	A2	L1	B	S	Kg.
UCT201		12	16	10	51	32	19	51	12	76	89	94	32	21	61	31	12.7	0.80
UCT201-B	1/2																	
UCT202-9	9/16		16	10	51	32	19	51	12	76	89	94	32	21	61	31	12.7	0.79
UCT202		15																
UCT202-10	5/8																	
UCT203		17	16	10	51	32	19	51	12	76	89	94	32	21	61	31	12.7	0.78
UCT203-11	11/16																	
UCT204-12	3/4		16	10	51	32	19	51	12	76	89	94	32	21	61	31	12.7	0.72
UCT204		20																
UCT205-14	7/8		16	10	51	32	19	51	12	76	89	97	32	24	62	34	14.3	0.88
UCT205-15	15/16																	
UCT205		25																
UCT205-16	1																	
UCT206-17	1-11/16		16	10	56	37	22	57	12	89	102	113	37	28	70	38.1	15.9	1.26
UCT206-18	1-1/8																	
UCT206		30																
UCT206-19	1-3/16																	
UCT206-20	1-1/4																	
UCT207-20	1-1/4		16	13	64	37	22	64	12	89	102	129	37	30	78	42.9	17.5	1.70
UCT207-21	1-5/16																	
UCT207-22	1-3/8																	
UCT207		35																
UCT207-23	1-7/16																	
UCT208-24	1-1/2		19	16	83	49	29	83	16	102	114	144	49	33	88	49.2	19	2.50
UCT208-25	1-9/16																	
UCT208		40																
UCT209-26	1-5/8		19	16	83	49	29	83	16	102	117	144	49	35	87	49.2	19	2.50
UCT209-27	1-11/16																	
UCT209-28	1-3/4																	
UCT209		45																

UCT 2XX



Unit No.	Shaft Dia.	Dimension																Weight
	d In	mm	N1	L2	H2	N2	N	L3	A1	H1	H	L	A	A2	L1	B	S	Kg.
UCT210-30	1-7/8		19	16	83	49	29	86	16	102	117	149	49	37	90	51.6	19	2.60
UCT210-31	1-15/16																	
UCT210		50																
UCT210-32	2																	
UCT211-32	2		25	19	102	64	35	95	22	130	146	171	64	38	106	55.6	22.2	4.00
UCT211-34	2-1/8																	
UCT211		55																
UCT211-35	2-3/16																	
UCT212-36	2-1/4		32	19	102	64	35	102	22	130	146	194	64	42	119	65.1	25.4	4.9
UCT212		60																
UCT212-38	2-3/8																	
UCT212-39	2-7/16																	
UCT213-40	2-1/2		35	21	111	70	41	121	26	151	167	224	70	44	137	65.1	25.4	7.00
UCT213		65																
UCT214-44	2-3/4		32	21	111	70	41	121	26	151	167	224	70	46	137	74.6	30.2	7.10
UCT214		70																
UCT215-47	2-15/16		32	21	111	70	41	121	26	151	167	232	70	48	140	77.8	33.3	7.50
UCT215		75																
UCT215-48	3																	
UCT216		80	32	21	111	70	41	121	26	165	184	235	70	51	140	82.6	33.3	8.20
UCT217-52	3-1/4		38	29	124	73	48	157	30	173	198	260	73	54	162	85.7	34.1	11
UCT217-52		85																

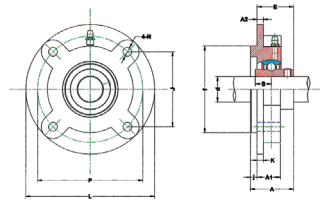
UCT 3XX



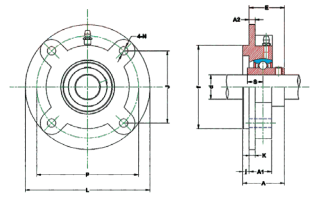
Bearing No.	Shaft Dia.	Dimension															Weight
	d mm	N1	L2	H2	N2	N	L3	A1	H1	H	L	A	A2	L1	B	S	Kg.
UCT305	25	16	12	62	36	26	65	12	80	89	122	36	26	76	38	15	1.41
UCT306	30	18	14	70	41	28	74	16	90	100	137	41	28	85	43	17	1.85
UCT307	35	20	15	75	45	30	80	16	100	111	150	45	32	94	48	19	2.45
UCT308	40	22	17	83	50	32	89	18	112	124	162	50	34	100	52	19	3.09
UCT309	45	24	18	90	55	34	97	18	125	138	178	55	38	110	57	22	4.08
UCT310	50	27	20	98	61	37	106	20	140	151	191	61	40	117	61	22	5.25
UCT311	55	29	21	105	66	39	115	22	150	163	207	66	44	127	66	25	6.41
UCT312	60	31	23	113	71	41	123	22	160	178	220	71	46	135	71	26	7.61
UCT313	65	32	25	116	70	43	134	26	170	190	238	80	50	146	75	30	9.22
UCT314	70	36	25	130	85	46	140	26	180	202	252	90	52	155	78	33	11.4
UCT315	75	36	25	132	85	46	150	26	192	216	262	90	55	160	82	32	12.9
UCT316	80	42	28	150	98	53	160	30	204	230	280	102	60	174	86	34	15.65
UCT317	85	42	30	152	98	53	170	32	214	240	298	102	64	183	96	40	19.34
UCT318	90	46	30	160	106	57	175	32	228	255	312	110	66	192	96	40	21.25
UCT319	95	46	31	165	106	57	180	35	240	270	322	110	72	197	103	41	24.4
UCT320	100	48	32	175	115	59	200	35	260	290	345	120	75	210	108	42	30.6
UCT321	105	48	32	175	115	59	200	35	260	290	345	120	75	210	112	44	30.2
UCT322	110	52	38	185	125	65	215	38	285	320	385	130	80	235	117	45	38.8
UCT324	120	60	42	210	140	70	230	45	320	355	432	140	90	267	126	51	54.6
UCT326	130	65	45	220	150	75	240	50	350	385	465	150	100	285	135	54	68.4
UCT328	140	70	50	230	160	80	255	50	280	415	515	155	100	315	145	59	83.2

NOTE: All inch Sizes Available.

UCFC 2XX



Unit No.	Shaft Dia	Dimension													Bolt Size	Weight
	d In	mm	L	P	J	A2	N	J	K	A1	f	A	E	S	mm	Kg.
UCFC201		12	90	70	49.5	10	10	4	5	19	55	28.3	27.4	11.5	M8	0.54
UCFC201-8	1/2															
UCFC202-9	9/16		90	70	49.5	10	10	4	5	19	55	23	25.9	11.5	M8	0.56
UCFC202		15														
UCFC202-10	5/8															
UCFC203		17	90	70	49.5	10	10	4	5	19	55	23	25.9	11.5	M8	0.54
UCFC203-11	11/16															
UCFC204-12	3/4		100	78	55.1	10	11.5	5	6	20.5	62	25.5	28.3	12.7	M10	0.76
UCFC204		20														
UCFC205-14	7/8		115	90	63.6	10	12	6	7	21	70	27	29.7	14.3	M10	0.96
UCFC205-15	15/16															
UCFC205		25														
UCFC205-16	1															
UCFC206	1-11/16		125	100	70.7	10	12	8	8	23	80	31	32.2	15.9	M10	1.37
UCFC206	1-1/4															
UCFC206		30														
UCFC206-19	1-3/16															
UCFC206-20	1-1/4															
UCFC207-20	1-1/4		135	110	77.8	11	14	8	9	26	90	34	36.4	17.5	M12	1.70
UCFC207-21	1-5/16															
UCFC207-22	1-3/8															
UCFC207		35														
UCFC207-23	1-7/16															
UCFC208-24	1-1/2		145	120	84.8	11	14	10	9	26	100	36	41.2	19	M12	2.00
UCFC208-25	1-9/16															
UCFC208		40														
UCFC209-26	1-5/8		160	132	93.3	10	16	12	10	26	105	38	40.2	19	M14	2.70
UCFC209-27	1-11/16															
UCFC209-28	1-3/4															
UCFC209		45														

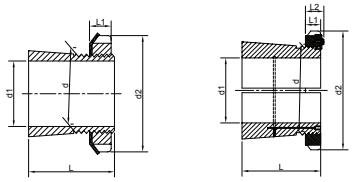


UCFC 2XX

Unit No.	Shaft Dia.		Dimension												Bolt Size	Weight
	d In	mm	L	P	J	A2	N	J	K	A1	f	A	E	S	mm	Kg.
UCFC210-30	1-7/8		165	138	97.6	10	16	12	14	28	110	40	42.6	19	M14	2.90
UCFC210-31	1-15/16															
UCFC210		50														
UCFC210-32	2															
UCFC211-32	2		185	150	106.1	13	19	12	13	30	125	42	46.4	22.2	M16	4.20
UCFC211-34	2-1/8															
UCFC211		55														
UCFC211-35	2-3/16															
UCFC212-36	2-1/4		195	160	113.1	17	19	12	15	36	135	48	56.7	25.4	M16	4.94
UCFC212		60														
UCFC212-38	2-3/8															
UCFC212-39	2-7/16															
UCFC213-40	2-1/2		205	170	120.2	16	19	14	15	35	145	49	55.7	25.4	M16	5.70
UCFC213		65														
UCFC214-44	2-3/4		215	177	125.1	17	19	14	16	38	150	52	61.4	30.2	M16	6.80
UCFC214		70														
UCFC215-47	2-15/16		220	184	130.1	18	19	16	17	39	160	55	62.5	33.3	M16	7.20
UCFC215		75														
UCFC215-48	3															
UCFC216		80	240	200	141.4	18	23	16	18	42	170	58	67.3	33.3	M20	8.70
UCFC217-52	3-1/4															
UCFC217		85	250	208	147.1	18	23	18	20	45	180	63	69.6	34.1	M20	10.30
UCFC218-56	3-1/2															
UCFC218		90	265	220	155.5	22	23	18	20	50	190	68	78.3	39.7	M20	13.50

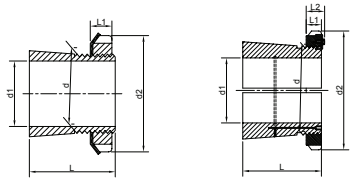
BEARING
ACCESSORIES

Adapter Sleeves



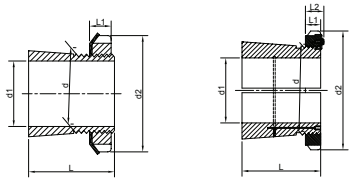
Shaft (mm)	Boundary Dimension (mm)			Desingation Adapter Sleeve. Complete	Weight (Kg)
d1	d	d2	L		
17	20	32	34	H204	0.04
		32	28	H304	0.04
		32	31	H2304	0.05
20	25	38	26	H205	0.06
		38	29	H305	0.07
		38	35	H2305	0.09
25	30	45	27	H206	0.09
		45	21	H306	0.1
		45	38	H2306	0.11
30	35	52	29	H207	0.12
		52	35	H307	0.14
		52	43	H2307	0.15
35	40	58	31	H208	0.16
		58	36	H308	0.18
		58	46	H2308	0.22
40	45	65	33	H209	0.21
		65	39	H309	0.23
		65	50	H2309	0.27
45	50	70	35	H210	0.24
		70	42	H310	0.27
		70	55	H2310	0.34
50	55	75	37	H211	0.28
		75	45	H311	0.32
		75	59	H2311	0.39
55	60	80	38	H212	0.31
		80	47	H312	0.35
		80	62	H2312	0.45
60	65	85	40	H213	0.36
	65	85	50	H313	0.42
	65	85	65	H2313	0.52
	70	92	52	H314	0.68
	70	92	68	H2314	0.88
65	75	98	43	H215	0.66
		98	55	H315	0.78

Adapter Sleeves



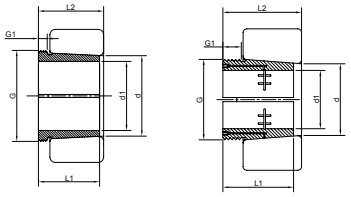
Shaft (mm)	Boundary Dimension (mm)			Desingation Adapter Sleeve. Complete	Weight (Kg)
d1	d	d2	L		
		98	73	H2315	1.10
70	80	105	46	H216	0.81
		105	59	H316	0.95
		105	78	H2316	1.20
75	85	110	50	H217	0.94
		110	63	H317	1.10
		110	82	H2317	1.35
80	90	120	52	H218	1.10
		120	65	H318	1.30
		120	86	H2318	1.60
85	95	125	55	H219	1.25
		125	68	H319	1.40
		125	90	H2319	1.80
90	100	130	58	H220	1.40
		130	71	H320	1.60
		130	97	H2320	2.00
		130	76	H3120	1.80
95	105	140	60	H221	1.60
		140	74	H321	1.85
100	110	145	63	H222	1.80
		145	77	H322	2.05
		145	105	H2322	2.75
		145	81	H3122	2.10
110	120	155	112	H2324	3.00
		145	72	H3024	1.80
		155	88	H3124	2.50
115	130	165	212	H2326	4.45
		155	80	H3026	2.80
		165	92	H3126	3.45
125	140	180	131	H2328	5.40
		165	82	H3028	3.05
		180	97	H3128	4.10
135	150	195	139	H2330	6.40
		180	87	H3030	3.75

Adapter Sleeves



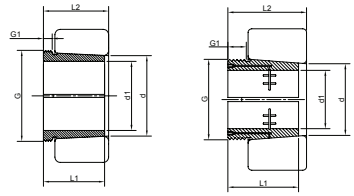
Shaft (mm)	Boundary Dimension (mm)			Desingation Adapter Sleeve. Complete	Weight (Kg)
d1	d	d2	L		
		195	111	H3130	5.25
140	160	210	147	H2332	8.80
		210	147	OH2332H	8.80
		190	93	H3032	5.10
	160	190	93	OH3032H	5.10
		210	119	H3132	7.25
		210	119	OH3132H	7.25
150	170	220	154	H2334	9.90
		220	154	OH2334H	9.90
		200	101	H3034	5.80
		200	101	OH3034H	5.80
		220	101	H3134	8.10
		220	122	OH3134H	8.10
160	180	230	161	H2336	11.00
		230	161	OH2336H	11.00
		210	109	H3036	6.70

Withdrawal Sleeves



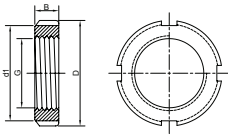
Shaft (mm)	Boundary Dimensions (mm)		Mass	Desingation	Shaft (mm)	Boundary Dimensions (mm)		Mass	Desingation
d1	d	G			d1	d	G		
35	40	M45*1.5	0.09	AH308	125		M145*2	2.00	AH*2326
		M45*1.5	0.13	AH2308			M135*2	0.88	AH*24026
40	45	M50*1.5	0.12	AH309			M140*2	1.15	AH*24126
		M50*1.5	0.16	AH2309	135	140	M150*2	1.00	AH3028
45	50	M55*2	0.13	AH* 310			M150*2	1.30	AH*3128
		M55*2	0.19	AH* 2310			M155*3	1.85	AH*3228
50	55	M60*2	0.16	AH* 311			M155*3	2.35	AH*2328
		M60*2	0.26	AH* 2311			M145*2	0.95	AH*2408
55	60	M65*2	0.19	AH* 312			M150*2	1.30	AH*24128
		M65*2	0.30	AH* 2312	145	150	M160*3	1.15	AH*3030
60	65	M70*2	0.22	AH313G			M165*3	1.80	AH*3130
		M75*2	0.39	AH2313			M165*3	2.20	AH*3230
65	70	M75*2	0.24	AH314G			M165*3	2.80	AH2330
		M80*2	0.45	AH*2314			M155*3	1.05	AH*24030
70	75	M80*2	0.29	AH315G			M160*3	1.55	AH*24130
	75	M80*2	0.53	AH*2315	150	160	M170*3	2.05	AH3032
75	80	M90*2	0.37	AH316			M180*3	3.20	AH3132
		M90*2	0.57	AH* 2316			M180*3	4.00	AH3232
80	85	M95*2	0.43	AH* 317			M180*3	4.65	AH2332
		M95*2	0.65	AH* 2317			M170*3	2.30	AH24032
85	90	M100*2	0.46	AH* 318			M170*3	3.05	AH24132
		M100*2	0.57	AH* 2318	160	170	M180*3	2.40	AH3034
		M100*2	0.76	AH* 2318			M190*3	3.45	AH3134
90	95	M105*2	0.54	AH* 319			M190*3	4.80	AH3234
		M105*2	0.90	AH* 2319			M190*3	5.25	AH2334
95	100	M110*2	0.58	AH* 320			M180*3	2.70	AH24034
		M110*2	0.66	AH* 3120			M180*3	3.25	AH24132
		M110*2	0.76	AH* 3220	170	180	M190*3	2.80	AH3036
		M110*2	1.00	AH* 2320			M200*3	3.75	AH2236
105	110	M120*2	0.76	AH* 3122			M200*3	4.25	AH3136
		M125*2	1.05	AH* 3222			M200*3	5.25	AH3236
		M125*2	1.35	AH* 2322			M200*3	6.05	AH2336
		M115*2	0.31	AH* 2422			M190*3	3.20	AH24036
115	120	M130*2	0.73	AH* 3024			M190*3	3.75	AH241136
		M130*2	0.94	AH* 3124	180	190	M205*4	3.40	AH3038

Withdrawal Sleeves

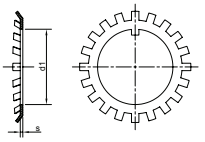


Shaft (mm)	Boundary Dimensions (mm)		Mass	Desingation	Shaft (mm)	Boundary Dimensions (mm)		Mass	Desingation
d1	d	G			d1	d	G		
		M135*2	1.30	AH* 3224			M210*4	4.25	AH2238
		M135*2	1.65	AH* 2324			M210*4	4.90	AH3138
		M125*2		AH* 24024			M210*4	5.90	AH3238
		M130*2		AH* 24124			M210*4	6.70	AH2338
125	130	M140*2	0.91	AH* 3026			M200*4	3.55	AH24038
		M140*2	1.10	AH* 3126			M200*4	4.45	AH24138
		M145*2	1.55	AH* 3226	190	200	M215*4	3.85	AH3040

Lock Nuts

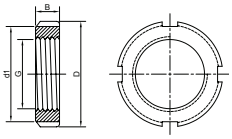


Locking Washer

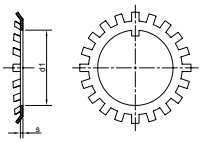


Thread	Boundary Dimensions (mm)					Mass	Desinga-tion	Locking Washer	Boundary Dimensions (mm)						Mass	Desin-gation
G	d1	D	B	B	H	Kg			d	d1	d2	s	e	f	Kg	
M10*075	135	18	4	3	2	0.006	KM0	MB0	10	135	21	1	3	8.5	1	MB0
M12*1	17	22	4	3	2	0.008	KM	MB1	12	17	25	1	3	10.5	2	MB1
M15*1	21	25	5	4	2	0.012	KM2	MB	15	21	28	1	4	13.5	3	MB2
M17*1	24	28	5	4	2	0.012	KM3	MB3	17	24	32	1	4	15.5	3	MB3
M20*1	26	32	6	4	2	0.020	KM4	MB4	20	6	36	1	4	18.5	4	MB4
M25*15	32	38	7	5	2	0.028	KM5	MB5	25	32	42	1.25	5	2.3	6	MB5
M30*15	38	45	7	5	2	0.038	KM6	MB6	30	38	49	1.25	5	27.5	8	MB6
M35*15	44	52	8	5	2	0.058	KM7	MB7	35	44	57	1.25	6	32.5	11	MB7
M40*15	50	58	9	6	2.5	0.078	KM8	MB8	40	5	62	1.25	6	37.5	13	MB8
M45*15	56	65	10	6	2.5	0.11	KM9	MB9	45	56	69	1.25	6	42.5	15	MB9
M50*15	61	70	11	6	2.5	0.14	KM10	MB10	50	61	74	1.25	6	47.5	16	MB10
M55*2	67	75	11	7	3	0.15	KM11	MB11	55	67	81	1.5	8	51.5	22	MB11
M60*2	73	80	11	7	3	0.16	KM12	MB12	60	73	86	1.5	8	57.5	24	MB12
M65*2	79	85	12	7	3	0.19	KM13	MB13	65	79	92	1.5	8	62.5	30	MB13
M70*2	85	92	12	8	3.5	0.22	KM14	MB14	70	85	98	1.5	8	66.5	32	MB14
M75*2	90	98	13	8	3.5	0.27	KM15	MB15	75	90	104	15	8	71.5	35	MB15
M80*2	95	105	15	8	3.5	0.36	KM16	MB16	80	95	112	1.75	10	76.5	46	MB16
M85*2	102	110	16	8	3.5	0.42	KM17	MB17	85	102	119	1.75	10	81.5	53	MB17
M90*2	108	120	16	10	4	0.51	KM18	MB18	90	108	126	1.75	10	86.5	61	MB18
M95*2	113	125	17	10	4	0.58	KM19	MB19	95	113	133	1.75	10	91.5	66	MB19
M100*2	120	130	18	10	4	0.68	KM20	MB20	100	120	142	1.75	12	96.5	77	MB20
M105*2	126	140	18	12	5	0.81	KM21	MB21	105	126	145	1.75	12	100.5	83	MB21
M110*2	133	145	19	12	5	0.89	KM22	MB22	110	133	154	1.75	12	105.5	91	MB22
M115*2	137	150	19	12	5	0.91	KM23	MB23	115	137	159	2	12	110.5	107	MB23
M120*2	135	145	20	12	5	0.69	KM24	MB24	120	138	164	2	14	115	108	MB24
	138	155	20	12	5	0.98	KM24	MB24	125	148	170	2	14	120	115	MB25
M125*2	148	160	21	12	5	1.10	KM5	MB25	130	149	175	2	14	125	115	MB26
M130*2	145	155	21	12	5	0.84	KML26	MB26	135	160	185	2	14	130	140	MB27
	149	165	21	12	5	1.20	KM26	MB26	140	160	192	2	16	135	135	MB28
M135*2	160	175	22	14	6	1.40	KM27	MB27	145	172	202	2	16	140	165	MB29
M140*2	155	165	22	12	5	0.92	KML28	MB28	150	171	205	2	16	145	180	MB30
	160	180	22	14	6	1.40	KM28	MB28	155	182	212	2.5	16	147.5	20	MB31
M145*2	171	190	24	14	6	1.85	KM29	MB29	160	182	217	2.5	18	154	215	MB32
M150*2	170	180	24	14	5	1.30	KM30	MB30	165	183	222	2.5	18	157.5	240	MB33
	171	195	24	14	6	1.85	KM30	MB30	170	193	232	2.5	18	164	240	MB34

Lock Nuts



Locking Washer

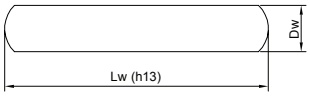


Thread	Boundary Dimensions (mm)					Mass	Desinga-tion	Locking Washer	Boundary Dimensions (mm)						Mass	Desin-gation
G	d1	D	B	B	H	Kg			d	d1	d2	s	e	f	Kg	
M155*3	182	200	25	16	7	2.05	KM31	MB31	180	203	242	2.5	20	174	260	MB36
M160*3	180	190	25	14	5	1.40	KML32	MB32								
	182	210	25	16	7	2.25	KM32	MB32								
M165*3	193	210	26	16	7	2.30	KM33	MB33								
M170*3	190	200	26	16	5	1.60	KML34	MB34								
	193	220	26	16	7	2.55	KM34	MB34								

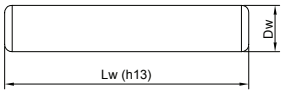
Cylindrical Roller

Roller Diameter Dw		Mass Per 100 Roller Kg.	Designation		Roller Diameter Dw		Mass Per 100 Roller Kg.	Designation
mm	inch				mm	inch		
3	5	0.027	RC3*5		16	16	2.5	RB12.7
3.5	5	0.037	RC3.5*5			24	3.73	RB13
	8	0.060	RC3.5*8		17	17	2.97	RB13.494
4	4	0.038	RC4*4			24	4.20	RB14
	6	0.058	RC4*6		18	18	3.57	RB14.288
	9	0.078	RC4*8			26	5.10	RB15
4.5	6	0.073	RC4.5*6		19	19	4.16	RB15.081
5	5	0.075	RC5*5			28	6.10	RB15.875
	6	0.091	RC5*6		20	20	4.85	RB16
	7	0.106	RC5*7			30	7.30	RB16.5
	8	0.121	RC5*8		21	21	5.60	RB16.669
	10	0.152	RC5*10			30	8.0	RB17
5.5	55	0.100	RC55*55		22	22	6.4	RB17.462
	8	0.146	RC5.5*8			34	10.4	RB18
6	6	0.130	RC6*6		23	23	7.4	RB18.256
	8	0.178	RC6*8			34	11.2	RB19
	12	0.261	RC6*12		24	24	8.4	RB19.05
6.5	65	0.166	RC6.5*65			36	12.6	RB19.844
	9	0.230	RC6.5*9		25	25	9.5	RB20
7	7	0.206	RC7*7			36	13.7	RB20.5
	10	0.30	RC7*10		26	26	10.7	RB20.638
	14	0.42	RC7*14			40	16.4	RB21
7.5	75	0.25	RC75*75		28	28	13.3	RB22
	11	0.37	RC75*11			44	21.0	RB22.225
8	8	0.31	RC8*8		30	30	16.3	RB22.5
	12	0.47	RC8*12			48	26.2	RB23
9	9	0.44	RC9*9		32	32	19.9	RB23.812
	14	0.98	RC9*14			52	32.4	RB24
10	10	0.60	RC10*10		34	34	23.9	RB25
	14	0.85	RC10*14			55	38.7	RB25.4
11	11	0.81	RC11*11		36	36	28.3	RB26
	15	1.10	RC11*15			58	45.3	RB26.988
12	12	1.04	RC12*12		38	38	33.3	RB28
	18	1.57	RC12*18					
	22	3.0	RB12.5					

Needle Roller



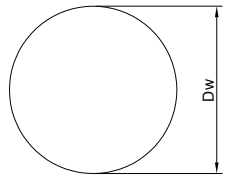
B



BF

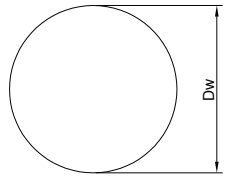
Principle Dimension		Mass Weight Per 100 Roller	Designation		Principle Dimension		Mass Weight Per 100 Roller	Designation	
Dw	Lw		Sphered end type	Flat end type	Dw	Lw		Sphered end type	Flat end type
1.5	5.8	0.008	RN1.5*5.8B	RN1.5*5.8BF	2.5	15.8	0.06	RN2.5*15.8B	RN2.5*15.8BF
	7.8	0.011	RN1.5*7.8BF	RN1.5*7.8BF		17.8	0.07	RN2.5*17.8B	RN2.5*17.8BF
	9.8	0.013	RN1.5*9.8B	RN1.5*8.8BF		19.8	0.08	RN2.5*19.8B	RN2.5*19.8BF
	11.8	0.016	RN1.5*11.8	RN1.5*11.8B		21.8	0.08	RN2.5*21.8B	RN2.5*21.8BF
	13.8	0.020	RN1.5*13.8B	RN1.5*13.8B		23.8	0.09	RN2.5*23.8B	RN2.5*23.8BF
2	7.8	0.02	RN2*7.8BF	RN2*7.8BF	3	9.8	0.05	RN3*19.8B	RN3*19.8BF
	9.8	0.02	RN2*9.8B	RN2*9.8BF		11.8	0.07	RN3*11.8B	RN3*11.8BF
	11.8	0.03	RN2*11.8BF	RN2*11.8BF		13.8	0.08	RN3*13.8B	RN3*13.8BF
	13.8	0.03	RN2*13.8B	RN2*13.8BF		15.8	0.09	RN3*15.8B	RN3*15.8BF
	15.8	0.04	RN2*15.8B	RN2*15.8B		17.8	0.10	RN3*17.8B	RN3*17.8BF
	17.8	0.04	RN2*17.8B	RN2*17.8BF		19.8	0.11	RN3*19.8B	RN3*19.8BF
	19.8	0.05	RN2*19.8B	RN2*19.8BF		23.8	0.13	RN3*23.8B	RN3*23.8BF
	21.8	0.05	RN2.5*21.8B	RN2.5*21.8BF		27.8	0.15	RN3*27.8B	RN3*27.8BF
2.5	7.8	0.03	RN2.5*7.8B	RN2.5*7.8BF	3.5	29.8	0.23	RN35*2.98B	RN35*29.8BF
	9.8	0.04	RN2.5*9.8B	RN2.5*9.8BF		34.8	0.27	RN35*3.48B	RN35*34.8BF
	11.8	0.05	RN2.5*11.8B	RN2.5*11.8BF	4	39.8	0.4	RN4*39.8B	RN4*39.8BF
	13.8	0.05	RN2.5*13.8B	RN2.5*13.8BF	5	49.8	0.75	RN5*49.8B	RN5*49.8BF

Steel Ball



Diameter		Mass Per 1000 Kg.	Designation		Diameter		Mass Per 100 Kg.	Designation
Dw mm	in				Dw mm	in		
0.4		0.003	RB-0.4		10.5		0.476	RB-10.5
					11		0.547	RB-11
0.5		0.0005	RB-0.5		11.112	7/16	0.564	RB-11.112
1		0.004	RB-1		11.5		0.625	RB11.5
1.5		0.014	RB-1.5		11.906	15/32	0.693	RB-11.906
1.588	1/16	0.016	RB-1.588		12		0.710	RB-12
2		0.033	RB-2		12.5		0.803	RB12.5
2.381	3/32	0.055	RB-2.381		12.700	½	0.842	RB-12.700
2.5		0.064	RB-2.5		13		0.903	RB-13
3		0.111	RB-3		13.494	17/32	1.01	RB13.494
3.175	1/8	0.132	RB3.175		14		1.13	RB-14
3.5		0.177	RB-3.5		14.288	9/16	1.20	RB-14.288
3.969	5/32	0.257	RB-3.969		15		1.39	RB15
4		0.263	RB-4		15.081	19/32	1.41	RB-15.081
4.5		0.374	RB-4.5		15.875	5/8	1.65	RB-15.875
4.762	3/16	0.446	RB-4.762		16		1.68	RB-16
5		0.514	RB-5		16.5		1.85	RB-16.5
5.5		0.679	RB-5.5		16.669	21/32	1.91	RB-16.669
5.556	7/32	0.702	RB-5.556		17		2.02	RB-17
6		0.882	RB-6		17.462	11/16	2.19	RB-17.462
6.350	¼	1.03	RB6.350		18		2.40	RB-18
6.5		1.13	RB-6.5		18.256	23/32	2.50	RB-18.256
7		1.41	RB-7		19		2.82	RB-19
7.144	9/32	1.50	RB-7.144		19.050	¾	2.84	RB-19.050
7.5		1.74	RB-7.5		19.844	26/32	3.24	RB-19.844
7.938	5/16	2.06	RB-7.938		20		3.29	RB-20
8		2.10	RB-8		20.5		3.54	RB-20.5
8.5		2.52	RB-8.5		20.638	13/16	3.62	RB-20.638
8.731	11/32	2.66	RB-8.731		21		3.81	RB-21
9		3.00	RB-9		22		4.38	RB-22
9.525	3/8	3.55	RB-9.525					
10		4.11	RB-10					
10.319	13/32	4.43	RB-10.319					

Steel Ball



Diameter		Mass Per 1000 Kg.	Designation		Diameter		Mass Per 100 Kg.	Designation
Dw mm	in				Dw mm	in		
22.225	7/8	0.452	RB-22.225		46.038	1 13/16	0.403	RB-46.038
22.5		0.468	RB-22.5		47.625	1 7/8	0.446	RB-47.625
23		0.500	RB-23		49.212	1 15/16	0.490	RB-49.212
23.812	15/16	0.555	RB-23.812		50		0.514	RB-50
24		0.568	RB-24		50.800	2	0.439	RB-50.800
25		0.642	RB-25		53.975	2 1/8	0.646	RB-53.975
25.400	1	0.674	RB-25.400		55		0.679	RB-55
26		0.723	RB-26		57.150	2 ¼	0.767	RB-57-150
26.988	1 1/16	0.808	RB-26.988		60		0.882	RB-60
28		0.902	RB-28		62.352	2 3/8	0.902	RB-62.352
28.575	1 1/8	0.955	RB-28.575		63.500	2 ½	1.03	RB-63.500
30		1.11	RB-30		65		1.13	RB-65
30.162	1 3/16	1.13	RB-30.162		66.675	2 5/8	1.22	RB-66.675
31.750	1 ¼	1.32	RB-31.750		69.850	2 ¾	1.40	RB-69.850
32		1.35	RB-32		70		1.41	RB-70
33		1.48	RB-33		73.025	2 7/8	1.60	RB-73.025
33.338	1 5/16	1.52	RB-33.338		75		1.74	RB-75
34		1.62	RB-34		76.200	3	1.82	RB-76.200
39.925	1 3/8	1.75	RB-34.925		80		2.10	RB-80
35		1.77	RB-35		82.550	3 ¼	2.31	RB-82.550
36		1.92	RB-36		85		2.52	RB-85
36.512	1 7/16	2.00	RB.36.512		88.900	3 ½	2.89	RB88.900
38		2.25	RB-38		90		3.00	RB-90
38.100	1 ½	2.27	RB-38.100		95		3.52	RB-95
39.688	1 9/16	2.57	RB-39.688		95.250	3 ¼	3.55	RB-95.250
40		2.63	RB-40		100		4.11	RB-100
41.275	1 5/8	2.90	RB-41.275		110		5.47	RB-110
42.862	1 11/16	3.24	RB-42.862		120		7.10	RB-120
44.450	1 3/4	3.61	RB-44.450		127	5	8.42	RB-127
45		3.74	RB-45					
					150		13.9	RB-150
					200		32.9	RB-200
					250		64.2	RB-250

Special Bearings

SPECIAL BEARINGS

NEEDLE ROLLER THRUST BEARINGS

Needle Roller Thrust Bearings can support heavy axial loads, are insensitive to shock loads and provide stiff bearing arrangements, which require a minimum of axial space. They are single direction bearings and can accommodate axial loads acting in one direction.

COMBINED NEEDLE ROLLER BEARINGS

Combined Needle Roller Bearings consist of a radial needle roller bearing combined
with a thrust bearing and are consequently able to accommodate both radial and axial loads. They provide the means to produce locating bearing arrangements in a minimum of radial space. They are particularly suited for application where the axial loads are too heavy, speeds are too high, or lubrication inadequate for simple thrust washer to be used or where other types of locating bearings occupy too much space.
ZNL combined needle roller bearings are available as

- Needle roller/angular contact bearings
- Needle roller/ thrust ball bearings and
- Needle roller/ cylindrical roller thrust bearings.

Cam Followers

ZNL Cam Followers are essential needle or cylindrical roller bearings, which have a solid stud instead of the inner ring. The stud is threaded so that the cam followers are filled with grease and are ready to mount and ready to use units.

MULTI - ROW CYLINDRICAL ROLLER BEARINGS

Four – Row and Six – Row Cylindrical Roller Bearings are used almost exclusively for the roll neck of rolling mill stands, calendars and roller presses. They are of separable design to considerably simplify bearing mounting, maintenance and inspection.
ZNL four-row cylindrical roller bearings have a cylindrical bore and some sizes are also available with a tapered bore as sealed bearings, with a seal on one or both sides of the bearing.

SPECIAL BEARINGS

FOUR – ROW TAPER ROLLER BEARINGS

Four – Row Taper Roller Bearings are used for rolling mill bearing arrangements where rolling speeds are moderate. Because of their special attributes are produce in several different design and sizes.

The extensive ZNL range of four-row taper roller bearings includes conventional designs with intermediate rings between the outer and/or inner rings, as well as new and modified designs. ZNL four-row taper roller bearings are produced in,

The TQI configuration with two pairs of the roller sets arranged back-to-back,

The TQO configuration with two pairs of the roller sets arranged face-to-face.

Available with either a cylindrical or tapered bore many sizes are also available with seals on one or both sides of the bearing.

CROSSED TAPER ROLLER BEARINGS

Crossed Taper Roller Bearings are particularly compact double direction taper roller thrust bearings and are mainly used in tables of machining centers, milling and drilling machine as well as radar antennae and welding robots.

ZNL crossed taper roller bearings consist of an outer ring and two-piece inner ring. Tapered rollers are arranged between the rings, with every second roller places at approximately right angles to the adjacent roller. Plastic discs separate the rollers. Because of their special internal geometry the power loss at the roller end contacts is minimal and heat generation is low.

SLEWING BEARINGS

Slewing Bearings are ball or cylindrical roller bearings that can accommodate axial, radial and moment loads acting either singly or in combination and in any direction. They are not mounted on a shaft or in house, the rings which are simply bolted on the seating surface are available in one of three executions:

- Without gears or
- With and internal gear or
- With an external gear.

SPECIAL BEARINGS

Single Row Slewing Ball Bearings

ZNL Single Row Slewing Ball Bearings are four-point contact ball bearings. The balls are inserted through a filling slot which is plugged afterwards. The bearings are sealed have no preloaded and are intended for applications where demands regarding accuracy are moderate.

Single Row Slewing Roller Bearings

ZNL Single Row Slewing Roller Bearings are crossed cylindrical roller bearings. Every second roller is at right angles to its neighboring roller. The rollers are inserted through a filling slot which is plugged afterwards. The bearings are under preloaded and have integral lip seals.

Double Row Slewing Bearings

These slewing rings are angular contact cylindrical roller bearings. The rollers are inserted through filling slots in one of the rings; the slots are plugged afterwards. Plastic separators provide optimum roller guidance. The bearings are normally preloaded and are fitted with integral lip seals.

Triple Row Slewing Bearings

Triple Row Slewing Bearings are combined radial and thrust cylindrical roller bearings for very heavy loads with one – piece and one two-piece ring.
The bearings are not under preloaded and have integral lip seals. These bearings places high demands on the seating surface.

Other Slewing Bearings

In addition to standard designs outlined above ZNL also produces several other designs, for a multitude of applications, to order. These include

- Slewing bearing as combined cylindrical roller/ball bearings,
- Slewing bearings as double row angular contact ball bearings,
- Dry sliding slewing bearings and
- Slewing bearings with integral drive.

HIGH - PRECISION BEARINGS FOR MACHINE TOOLS

ZNL manufactures a wide range of precision bearings that are intended for use in machine tools application and other applications where accuracy and high speed capabilities are important. ZNL precision bearings are available in several ISO dimension series and in a wide range of sizes. The product range includes traditional all steel bearings as well as hybrid bearings.
Single Row Angular Contact Ball Bearings
ZNL high-precision all – steel and hybrid angular contact ball bearings are available as normal as well as high –speed bearings in three ISO Dimension series with two different contact angles each.
ZNL offers three series of high-precision angular contact thrust ball bearings with different contact angles as all-steels or hybrid bearings. They are specially suited to application demanding accuracy and rigidity of the machine tool work spindles.

PLC Series

ZNL Bearings has been serving PLC series to Czech defense and also fitted to the wheel hub application. Currently, we are manufacturing PLC Series to our one of the esteemed client named TATRA – a leading Czech automobile giant.

Manufacturing Facility:
Plot No. 24,25&26-A/B,
Changodar Industrial Estate,
Sanand, Ahmedabad-382213. INDIA.
Ph: +91 2717 612200 | Tele Fax: +91 2717 251097
E mail: info@znlbearings.com

Corporate Office:
C-205, Eastern Court, Tejpal Rd., Vile Parle East,
Mumbai, Maharashtra-400057. INDIA.
Ph: +91 22 2610 0947/0948
Tele Fax: +91 22 26100946
E mail: sales@znlbearings.com

www.znlbearings.com
Email: sales@znlbearings.com