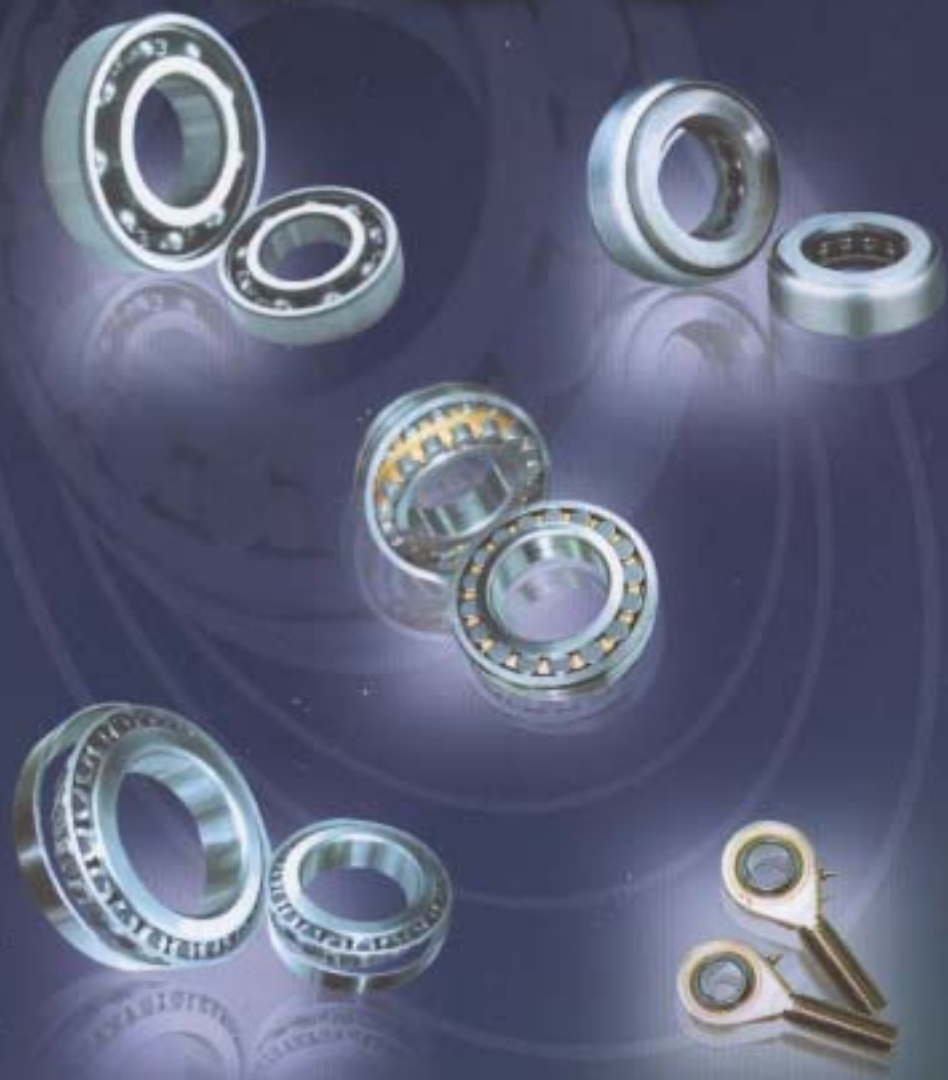


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FBJ Bearings International

FBJ took over FKC's more than 50 year's accumulation of technology and know-how. FBJ is proud of the production of clutch release bearings and wheel bearings especially, and special bearings will be designed and manufactured in accordance with customers' request.

Since 1950, our experience in bearing manufacturing has been kept us as a leading bearing manufacture. Our position of leadership is maintained through the application of advanced technologies, significant investment in tooling for machining, grinding, assembly and testing, and process control systems.

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In today's competitive business climate, performance is what sets apart. From bearing design to delivery of a quality product, on-time, at a competitive price, FBJ is committed to being the bearing supplier of choice.

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FBJ bearings support automotive, industrial and agricultural market providing superior quality products with most competitive pricing. Origin Equipment Manufacturer (**OEM**) is also our specialties.

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FBJ networks over Japan, Singapore, Asia Pacific, Africa continent and Central & South America.

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Working with **FBJ franchising program**, besides transferring bearing's know-how, we support Small & Medium Enterprise (**SME**) to establish Business Operation Unit (**BOU**).

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Sincerely Yours,

The Management of **FBJ** International

1. Introduction to Rolling Bearings

1.1 Construction

Most rolling bearings consist of an inner ring and an outer ring, rolling elements (either balls or rollers) and a retainer (cage). The cage separates the rolling elements at regular intervals holds them in place within the inner and outer raceways, and allows them to rotate freely. (fig 1.1-1.8)

Rolling elements come in two basic shapes: ball or rollers. Rollers come in four basic types: cylindrical, needle, tapered, and spherical.

Balls geometrically contact the raceway surfaces of the inner and outer rings at points, while the contact surface of rollers is a line contact.

Theoretically, rolling bearings are so constructed as to allow the rolling elements to rotate orbitally while also rotating on their own axes at the same time.

While the rolling elements and the bearing rings take any load applied to the bearings (at the contact point between the rolling elements and raceway surfaces), the case takes no direct load. It only serves to hold the rolling element at equal distances from each other and prevent them from falling out.

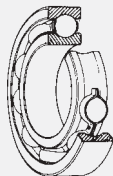
1.2 Classification

Rolling bearings fall into two main classifications: ball bearings and roller bearings. Ball bearings are Classified according to their bearing ring configurations: deep groove, angular contact and thrust types. Roller bearings on the other hand are classified according to the shape of the rollers: cylindrical, needle, tapered and spherical.

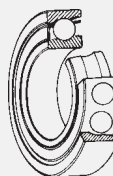
1.3 Characteristics

Rolling bearings come in many shapes and varieties, each with its own distinctive features.

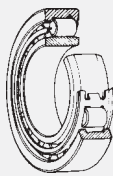
However, when compared with sliding bearings, in rolling bearings the starting friction coefficient is lower and only a little difference between this and the dynamic friction coefficient is produced. They are internationally standardized, interchangeable and readily obtainable. Lubrication is easy and consumption is low.



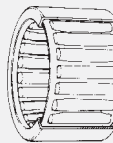
Deep groove Ball Bearing
Fig. 1.1



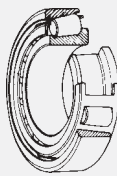
Angular contact Ball Bearing
Fig. 1.2



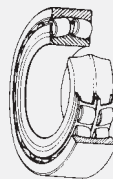
Cylindrical Roller Bearing
Fig. 1.3



Needle Roller Bearing
Fig. 1.4



Tapered Roller Bearing
Fig. 1.5



Spherical Roller Bearing
Fig. 1.6



Thrust Ball Bearing
Fig. 1.7



Spherical Thrust Roller Bearings
Fig. 1.8

Ball bearings and roller bearings

When comparing ball and roller bearings of the same dimensions, ball bearings exhibit a lower frictional resistance and lower face run-out in rotation than roller bearings.

This makes them more suitable for use in applications which require high speed, high precision, low torque and low vibration. Conversely, roller bearings have a larger load carrying capacity which makes them more suitable for applications requiring long life and endurance for heavy loads and shock loads.

Radial and thrust bearings

Most of rolling bearings can carry both radial and axial loads at the same time.

Bearings with a contact angle of less than 45° have a much greater radial load capacity and are classified as radial bearings. Bearings which have a contact angle over 45° have a greater axial load capacity and are classified as thrust bearings. There are also bearings classified as complex bearings which combine the loading characteristics of both radial and thrust bearings.

2. Calculation of Service Life

To select an appropriate rolling contact bearing, it is necessary to know operating conditions, i.e., the magnitude and the direction of loads, the nature of loading applied, rotational speeds of one, or both, rings, the required service life, the working temperature of the bearing unit, and other requirements dependable on the structural features of the machine in question.

The bearing service life, is understood to mean the time expressed in total number of revolutions made by one of the bearing rings relative to the other rings or any other rolling elements. It can be expressed in million of revolutions or operating hours. The basic rated resource (i.e., the estimated service life) means the operating life of a batch of bearings wherein not less than 90% of identical bearings would operate without any indication of fatigue failure on their bearing surfaces under similar loads and rotational speeds. The main certified characteristic of a bearing - the basic dynamic load-carrying rating, denoted with symbol C_r , is a load to be sustained by a rolling contact bearing over the time it makes one million revolutions. Depending on the bearing design, the dynamic load-carrying capacity of bearings as estimated in accordance with the ISO Recommendations on Rolling Bearings, is given in Tables of the present Catalogue.

The relationship between the basic rated resource, the dynamic load-carrying capacity rating, and the load acting on the bearing at a rotational speed of $n > 20$ min⁻¹ is calculated with the formula:

$$L_{10} = \left(\frac{C_r}{P} \right)^p \text{ million rotations} \dots\dots 2.1$$

Where L_{10} – is the basic rated resource, in million of revolutions;

C_r – is the basic dynamic load-carrying capacity rating, N;

P – is the equivalent dynamic load, N;

P – is the exponent of a power, for ball bearings: $P = 3$;

for roller bearings $P = \frac{10}{3}$

The basic rated resource is mainly expressed in operating hours:

$$L_{10h} = \frac{1000000}{60n} \left(\frac{C_r}{P} \right)^p, \text{ hour} \dots\dots 2.2$$

where L_{10} – is the basic rated resource, hour;
 P – the rotational frequency, min⁻¹

For vehicles, the basic rated resource of hub bearings is sometimes more convenient to express in total kilometers running:

$$L_{10s} = \frac{\pi D_1}{1000} L_{10}$$

Where L_{10s} – is the basic rated resource, million kilometers (mln.km);

D_1 – is the wheel diameter in meters, m.

Under normal operating conditions, the basic rated resource calculated at 90% reliability level (L_{10}) satisfies the majority of cases of bearings employment, since actually attainable life is more than calculated one. Also, at 50% reliability the service life (L_{50}) is, as a rule, five times as that of the basic rated resource (L_{10}). To improve the compactness of bearing units and to reduce their weight, it is not recommended to overestimate the basic rated resource. However, in a number of technical fields another level of reliability is required. Besides, due to the extensive research and development activity, it has been found that the conditions of lubrication greatly affect the bearing service life. Hence, ISO has introduced a notation of basic rated resource, the formula of which is of the following form:

$$L_{na} = a_1 a_2 a_3 \left(\frac{C_r}{P} \right)^p \text{ or} \dots\dots 2.3$$

$$L_{na} = a_1 a_2 a_3 L_{10},$$

Where L_{na} – is the adjusted rated resource/million revolutions, Factor n means the difference between the given reliability and 100% level (e.g., at 95% reliability, $L_{na} = L_{5a}$);

a_1 – is the reliability factor;

a_2 – is the material factor;

a_3 – is the operating conditions factor.

For the generally adopted 90% reliability, as well as for proper bearing steel quality and lubrications conditions which ensure the separation of bearing surfaces in contact within the recommended limits, $a_1 = a_2 = a_3 = 1$ and the formula for the adjusted rated resource (3) becomes identical to the main formula 2.1.

Table 2.1 Values of the Reliability Factor

Reliability, percent	L_{10a}	a_1
90	L_{10a}	1
95	L_{5a}	0.62
96	L_{4a}	0.53
97	L_{3a}	0.44
98	L_{2a}	0.33
99	L_{1a}	0.21

Whenever there is a necessity to carry out calculations for bearings with the reliability level in excess of 90%, the values of the reliability factor, a_1 , shall be taken from Table 2.

Table 2.2 Factors a_{23}

Type of Bearing	Vacuum Treated Steel				
	Values of Viscosity Coefficient $c = n / n_1$				
	0.1-0.2	0.2-0.5	0.5-1	1-2	2-3
	Values of Factor a_{23}				
Radial and Angular Contact Ball Bearings	0.1-0.3	0.3-0.7	0.7-1.0	1.0-1.5	1.5-2.0
Roller Spherical Bearings, Double-row	0.1-0.2	0.2-0.4	0.4-0.7	0.7-1.0	1.0-1.2
Roller Bearings, with Short Cylindrical Rollers or Needles	0.1-0.4	0.4-0.6	0.6-1.0	1.0-1.5	1.5-1.8
Spherical Roller Angular Contact Thrust Bearings	0.1-0.2	0.2-0.4	0.4-0.7	0.7-1.0	1.0-1.2

Notes :

1. For the case of ESR steel used and clean lubricants, factor a_{23} may be increased at $X > 2$,
2. In case of excessive lubricant contamination with hard particles or poor oil circulation, a_{23} shall be taken to be 0.1.

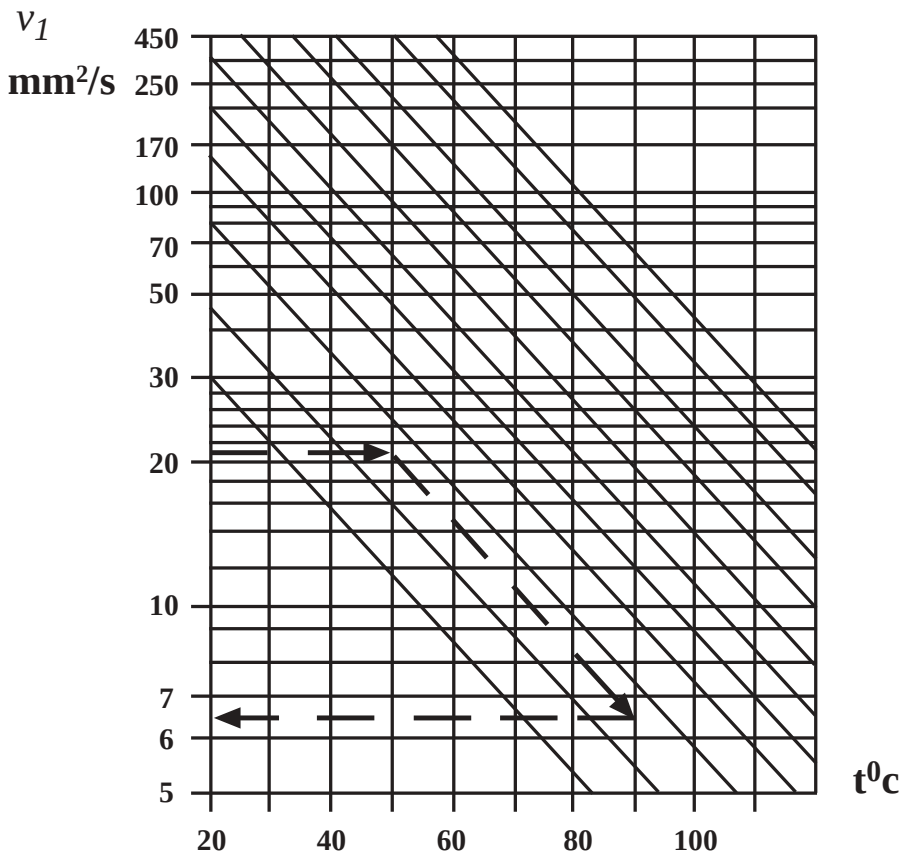


Fig. 1. A nomograph chart to determine lubricant viscosity at operating temperatures when its viscosity at basic temperature is known

However, it is expedient to use factor a_1 only in case of an increase in factor a_2 and a_3 ; otherwise, an increase in overall dimensions of the bearing results, hence, a reduction in its speed, and increase in its weight and sluggishness of the rotating parts of the machine associated with this bearing.

The operating conditions factor, a_3 , specifies mainly lubricant conditions, as well misalignment, housing and shaft rigidity, bearing arrangement; clearances in bearings. Considering the fact that the use of special, higher-grade steels do not compensate the adverse effect of lubricant shortage, factor a_2 , and a_3 are combined in one, with the notation a_{23} .

The factor a_{23} is selected from Table 3, by the ratio of normative and actual kinematic viscosity of the lubricant used:

$$\chi = \frac{v}{v_1} \dots\dots\dots 2.4$$

Where χ – is the viscosity coefficient;
 v – is the kinematic viscosity of the oil actually used, at the bearing unit operating temperature, $\text{mm}^2\cdot\text{s}^{-1}$;
 v_1 – is the normative kinematic viscosity of oil as required to ensure lubrication conditions at a given velocity, $\text{mm}^2\cdot\text{s}^{-1}$;

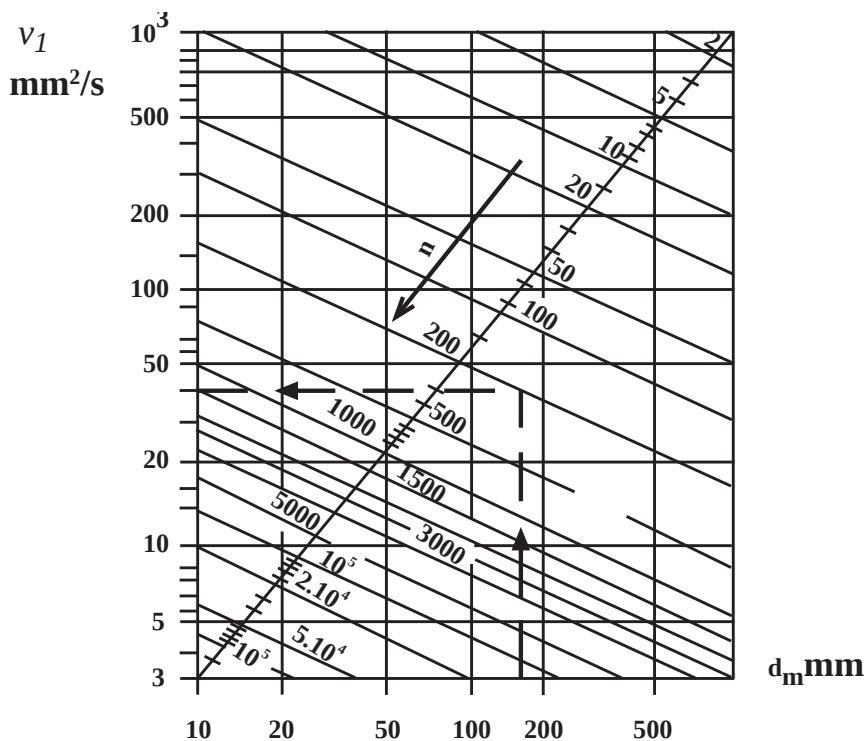


Fig. 2. A nomograph chart to determine normative lubricant viscosity, v_1

Bearing Data

Table 2.3. Recommended Values of the Basic Rated Resource for Machines of Different Type

Machine Type and Employment	L_{10h} , hr	L_{10s} , mln, km
Devices and mechanisms used at regular intervals, agricultural machines, household appliances	500-4000	-
Machanisms used for a short periods of time, erecting cranes,building machines	4000-8000	
Critical mechanisms used intermittently (accessory mechanisms at power plant stations, conveyors for series production, elevators, metal-cutting machine tools used from time to time)	8000-12000	
One-shift operated machines, underloaded (stationery electric moters, reduction gears, crushers (mills)	12000-20000	
One-shift operated machines, under full load (metal-cutting machine-tools, wood-cutting machines), general-type machine-tools used in machine-building, lifting cranes, ventilators, separators, centriguges, polygraph equipment.	20000-30000	
Machines to be used on a round-the-clock basis (compressors, pumps, mine lifters, stationery electric motors, equipment used in textile industry)	40000-50000	
Hydropower stations, rotary funaces, deep-sea vessels engines	60000-100000	
Continuous-operation heavy-duty machines (paper working equipment, power plants, mine pumps, flexible shafts of deep-sea vessels)	100000	
Wheel-hubs of cars		0.2-0.3
Wheel-hubs of buses, industrial-type vehicles		0.3-0.5
Railway freight-car journal boxes		0.8
Suburbian car and tram journal boxes		1.5
Passenger-car journal boxes		3.0
Locomotive journal boxes		3.0-5.0

The values of the kinematic viscosity of oil, i.e., the operating viscosity, is determined with the help of a nomograph, Fig. 1. To obtain the operating viscosity, it is necessary to know the bearing temperature and the initial kinematic viscosity of the oil used. Fig. 2. Contains a nomographic chart which is based on resilient hydrodynamic conditions of the lubricant, wherefrom we determine the normative (or standard) kinematic viscosity, ν_1 . This arbitrary kinematic viscosity of oil is chosen as function of the speed of motion of the contact element; the latter is obtained based on the following two parameter: the mean diameter and the rotational speed. For example, to calculate the standard viscosity of oil, ν_1 , for a bearing with a rotational speed of $n = 200 \text{ min}^{-1}$ and a mean diameter of $d_m = 150 \text{ mm}$, it is necessary-from the X-axis of mean diameters-to pass over to the corresponding rotational speed which is represented by an inclined line, and choose on the Y-axis the respective value of ν_1 ($\nu_1 = 44 \text{ mm}^2\text{S}^{-1}$ in Fig. 2. Indicated with the arrow).

The discussed procedure of determination of the viscosity coefficient is related to oil. For greases, this coefficient is found for a disperse media, i.e., on the base of the kinematic viscosity of the basic liquid oil which is a component of the grease. However, grease lubrication possesses certain special features of its own.

Most often than not, the designer knows the desired service life of the machine component in question. If these data are not available, the basic design life may be recommended from Table 4.

Equivalent Dynamic Load Calculation

Equivalent dynamic load (P) applied to radial and angular contact ball and roller bearings is a constant radial load that, when applied to a bearing with the inner ring running and the outer ring fixed, ensures the same design service life as that under actual load and rotation conditions. For bearings of the above-mentioned type, the equivalent load is found from the formula:

$$P_r = XF_r + YF_a \dots\dots\dots 2.5$$

Where P_r – is the equivalent dynamic load, H;
 F_r – is the radial load constant in direction and value, H;
 F_a – is the axial load constant in direction and value, H;
 X – is the coefficient of radial load;
 Y – is the coefficient of axial load;

In case of $F_r/F_a \leq e$, is assumed,

$$P_r = F_r \dots\dots\dots 2.6$$

Where e – is the limited value of F_r/F_a , which determines the choice of factors X and Y .

Values of X , Y and e are specified in this Catalogue.

Accordingly, for an angular contact thrust bearing the equivalent dynamic load (P_a) is a constant axial load to be found in the same way:

$$P_a = XF_r + YF_a \dots\dots\dots 2.7$$

while for a thrust bearing it has the following form:

$$P_a = F_a \dots\dots\dots 2.8$$

The resultant load, F , acting upon the bearing can be determined rather accurately from laws of motion, if external forces are known. For example, loads transferred to the shafts/by machine elements are to be calculated as the reaction of the supports in accordance with equations for beams subjected to static loads. A shaft is regarded as a simply two supported beam resting in bearing supports. Using the momental equation and those for the sum of forces acting upon the beam, the reaction of the supports is obtained; the latter, if taken with an opposite sign, represents the load applied to the bearing. The load is generated by the forces of the weight sustained by the bearing; by forces arising due to power transmission via the geartrain and/or belt transmission; by cutting forces in metal-cutting machine-tools; by inertial forces; by impact loads, etc.

The resultant load on the bearing, F , directed at any angle to the bearing axis of rotation, may be resolved into a radial (F_r) and axial (F_a) components. Sometimes, it is rather difficult to determine this load because of the variety of force factors and application of incidental forces. Hence, any mathematical techniques are applicable to calculate the same. For practical purposes, there may be recommended certain approved procedures for calculation of the resultant force, F .

If the force acting upon a bearing fluctuates linearly within $P_{\min}$ to $P_{\max}$ (e.g., at the supports of single-sided winding drums, then, the value of F has the form:

$$F = \frac{P_{\min} + 2P_{\max}}{3} \dots\dots\dots 2.9$$

If operating duties are of a varying nature, i.e., load F_1 acts within the period t_1 , at a rotational speed n_1 , while during the period t_2 , at a rotation speed n_2 acts the load F_2 and so on, then, the amount F takes the form:

Equivalent Dynamic Load Calculation

$$F = \left(\frac{n_1 t_1 F_1^p + n_2 t_2 F_2^p + n_i t_i F_i^p}{n_1 t_1 + n_2 t_2 + \dots n_i t_i} \right)^{\frac{1}{p}} \dots\dots\dots 2.10$$

where $p = 3$ for ball bearings, and

$$p = \frac{10}{3} \text{ for roller bearings.}$$

The assessment of average values of loads in accordance with the above-mentioned relationships is valid not only for radial loads but, also, for any load of constant direction of application relative to the bearing radial plane. For radial bearing, a radial load is calculated, and for a thrust bearing the load applied along the bearing axis. Whenever the force generated by the load is applied at an angle to the radial plane of the bearing, radial and axial components are to be calculated. An equivalent load (radial one in case of radial bearings and axial for thrust bearings) is assessed with these components accounted for.

In case of a rotational load applied to a bearing (Fig. 3), the magnitude of the rotating force is found as follows:

$$F = mrw^2, H, \dots\dots\dots 2.11$$

Where m – is the mass of the rotating element, kg;
 r – is the distance from the bearing axis to the centre of gravity of the rotating element, m;
 w – is the angular velocity of the rotating element, rad/s.

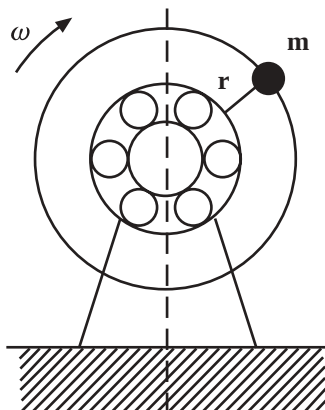


Fig. 3. Diagram of loading a bearing with rotational force.

Bearing Data

Table 2.4 Values of Loading Factor, K_6 , as a Function of the Type of Loading and the Fields of Bearing Application

Type of Loading	K_6	Field of Application
Light jerks, short-time overloads up to 125% of the rated (nominal) load	1.0-1.2	Precision gear trains, Metal-cutting machine-tools (with the exception of slotting, planing, and grinding machine-tools). Gyroscopes. Lifting cranes component mechanisms. Electric tackles and monorail trucks. Mechanically-driven winches. Electric motors of low and average power. Light-duty ventilators and blowers.
Moderate jerks, vibratory load; short-time overloads up to 150% of the rated (nominal) load	1.2-1.5	Gear trains. Reduction gears of all types. Rail rolling stock journal boxes. Motion mechanisms of crane trolleys. Crane swinging mechanisms, and boom overhang control mechanisms. Spindles of grinding machine-tools. Electrical spindles. Wheels of cars, buses, motorcycles, motoroller. Agricultural machines.
Same, under conditions of improved reliability	1.5-1.8	Centrifuges and separators. Journal boxes and traction engines of electric locomotives. Mechanisms of crane positioning. Wheels of trucks, tractors, prime movers, locomotives, crane and road-building machines,. Power electric machines. Power-generating plants.
Loads with considerable jerks and vibrations; short-time overloads up to 200% of the rated (nominal) load	1.8-2.5	Gears. Crushers and pile driver. Crank mechanisms. Ball and impact mills. Frame saws. Rolling mill rollers. High-power ventilators and exhausters.

In a number of cases, it is not quite easy to perform accurate calculations of loading a bearing. For example, journal boxes of teh rolling stock take up not only the carriage weight force which is easy to determine by calculation. When on move at varying speeds. bearings are subjected to impact loads at rail joints and when passing railroad switches, inertiaal loads on turns and during emergency breaking. Whenever these factors cannot be accounted for accurately, one resorts to the experience accrued on the machines of earlier producion.

Based on teh analysis of their operation, there has been derived a so-called loading factor, k_6 , to be multiplied into teh equivalent load as obtained from the equations 2.5 to 2.8 . In the equivalent load the inertial forces, inherent to the vibration machines, sieves, and vibratory mills, have been already accounted for. For smooth mild loads, without jerks, in such mechanisms as low-power kinematic reduction gears and drives, rollers for supporting conveyor belts , pulley tackles, trolleys, controls drives and other similar mechanisms, the magnitude of the loading factor is $k_6 = 1$. The same value of the factor is taken if there is a belief in an accurate match between the calculated and actual loads. Table 2.5 contains recommended values of the loading factor k_6 .

With the equivalent load (P) known, the basic rated resource (L_{10}) selected, the basic dynamic load-carring capacity (C) is determined by computation, and the required standard size is chosen from the Catalogue with due account of Table 2.1.

Equivalent Static Load Calculation

For a bearing at rest, under load P, the service life equation (1) is inapplicable , since at $L = 0, p = \infty$, the bearing cannot accomodate load as high as is wished. At a low rotational speed ($n \leq 20 \text{ min}^{-1}$), P values turn out to be overstated. Consequently, for bearings which rotate at low speeds, if at all, -especially when operated under impact loads-the allowable load depends on residual deformation originating at points of contact of balls/rollers and rings rather than on the fatigue service life. The static load-carrying capacity of a bearing means the allowable load a bearing should withstand with no marked adverse impact on its further employment due to the residual deformation.

Thus, the purely radial load, or purely axial load-depending on whether the radial or angular contact bearings are in question-that results in combined (ring-ball/roller) residual deformation of up to 0,0001 diameter of the rolling elements, is termed the basic static load-carrying capacity, denoted in general as C_{0r} , or C_{0a} or C_{0a} for radial and axial basic load carrying capacity,, respectively. In accordance with the ISO Standard, this amount of the residual deformation is

caused by a load that generates a maximum rated contact stress at the most highly loaded rolling element which is 4200 MPa for bearings (with teh exception of self-aligning double-row bearings), and 4000 MPa for roller bearings. In this Catalogue, values of the basic static load-carring capacity are given as calculated on the above bases.

When testing a stationery (non-rotating) bearing for static load-carrying capacity under a load applied in any direction, it is necessary to calculate teh equivalent static load in that direction with which the static load-carrying capacity of the bearing is associated. This equivalent static load results in the same amount of residual deformation. For radial and angular contact ball and roller bearings the magnitude of the equivalent static load, P_0 is found from teh formula:

$$P_{0r} = X_0 F_r + Y_0 F_a \dots\dots\dots 2.12$$

and for angular-contact thrust ball and roller bearings P_0 is found as follows:

$$P_{0a} = F_a + 2,3 F_r \operatorname{tg} \alpha \dots\dots\dots 2.13$$

Where P_{0r} – is the equivalent static radial load, H;
 P_{0a} – is teh equivalent static axial load, H;
 F_r – is the radial load or the radial component of the load acting upon the bearing, H;
 F_a – is the axial load or the axial component of the load acting upon the bearing, H;
 X_0 – is the radial load coefficient;
 Y_0 – is the radial load coefficient;
 α – is the nominal contact angle of a bearing, deg.

Thrust ball and roller bearings ($\alpha = 90^\circ$) are capable to withstand axial loads, only. The equal load for these types of bearings is calculated from teh formula $P_{0a} = F_a$.

The values of radial and axial load coefficients, as well as particular cases of application of Equations (12) and (13) are given in Tables of teh present Catalogue.

It is necessary that teh load acting upon a bearing not to exceed the tabulated basic load-carrying capacity (C_0). Deviations from this rule are based on experimental data. Thus, if the notion of the static

safety coefficient $S_0 \left(S_0 = \frac{C_0}{P_0} \right)$ is introduced, then, for a

smooth. i.e., without vibrations and jerk load, low rotational speed, and low accuracy requirements, $s_0 > 0,5$ overload can be admitted; under normal operating conditionals, $s_0 = 1-1,5$ is accepted in the general machine-tool building industry; under impact loads, periodic static loads and strict requirements to the accuracy, the load is limited down to $s = 1,5-2,5$.

3. Tolerances

For dimensional accuracy standards prescribe tolerances and allowable error limitations for those boundary dimensions (bore diameter, outside diameter, width, assembled bearing width, chamfer, and taper) necessary when installing bearings on shafts or in housings. For machining accuracy the standards provide allowable variation limits on bore, mean bore, outside diameter, mean outside diameter and raceway width or all thickness (for thrust

bearings). Running accuracy is defined as the allowable limits for bearing runout. Bearing runout tolerances are included in the standards for inner and outer ring radial and axial runout; inner ring side runout with bore; and outer ring outside surface runout with side. Tolerances and allowable error limitations are established for each tolerance grade or class.

A comparison of relative tolerance class standards is shown in the Table 3.1.

Table 3.1 Comparison of tolerance classifications of national standards

Standard		Tolerance Class					Bearing Types
International Organization for Standardization	ISO 492	Normal Class Class 6X	Class 6	Class 5	Class4	Class 2	Radial bearings
	ISO 199	Normal Class	Class 6	Class 5	Class4	-	Thrust ball bearings
	ISO 578	Class 4	-	Class 3	Class 0	Class 00	Tapered roller Bearings (Inch series)
	ISO 1224	-	-	Class 5A	Class 4A	-	Precision instrument Bearings
Japanese Industrial Standard	JIS B 1514	class 0 class 6X	Class 6	Class 5	Class 4	Class 2	All type
Deutsches Institut	DIN 620	P0	P6	P5	P4	P2	All type
American National Standards Institute (ANSI) Anti-Friction Bearing Manufacturers (AFBMA)	ANSI/AFBMA Std.201)	ABEC-1 RBEC-1	ABEC-3 RBEC-3	ABEC-5 RBEC-5	ABEC-7	ABEC-9	Radial bearings (Except tapered Roller bearings)
	ANSI/AFBMA Std. 19.1	Class K	Class N	Class C	Class B	Class A	Tapered roller bearing (Metric series)
	ANSI / B 3.19 AFBMA Std.19	Class 4	Class 2	Class 3	Class 0	Class 00	Tapered roller bearings (Inch Series)
	ANSI/AFBMA Std. 12.1	-	Class 3P	Class 5P Class 5T	Class 7P Class 7T	Class 9P	Precision instrument ball bearings (Metric Series)
	ANSI/AFBMA	- Std. 12.2	Class 3P	Class 5P	Class 7P Class 5T	Class 9P Class 7T	Precision instrument ball bearings (Inch Series)

Table 3.2 Bearing types and applicable tolerance

Bearing type		Applicable standard	Applicable tolerance				
Deep groove ball bearing		ISO 492	Class 0	Class 6	Class 5	Class 4	Class 2
Angular contact ball bearings			Class 0	Class 6	Class 5	Class 4	Class 2
Self-aligning ball bearings			Class 0	-	-	-	-
Cylindrical roller bearings			Class 0	Class 6	Class 5	Class 4	Class 2
Needle roller bearings			Class 0	Class 6	Class 5	Class 4	-
Spherical roller bearings			Class 0	-	-	-	-
Tapered Roller Bearings	Metric	ISO 492	Class 0,6X	Class 6	Class 5	Class 4	-
	Inc	AFBMA Std.19	Class 4	Class 2	Class 3	Class 0	Class 00
Thrust ball bearings		ISO 199	Class 0	Class 6	Class 5	Class 4	-

Codes and Symbols

Dimension

- d : Nominal bore diameter
- d_2 : Nominal bore diameter (double direction thrust ball bearing)
- D : Nominal outside diameter
- B : Nominal inner ring width or nominal center washer height
- C : Nominal outer ring width1)
Note 1) For radial bearings (except tapered roller bearings) this is equivalent to the nominal bearings width.
- T : Nominal bearing width of single row tapered roller bearing, or nominal height of single direction thrust bearing.
- T_1 : Nominal height of double direction thrust ball bearing, or nominal effective width of inner ring and roller assembly of tapered roller bearing

- T_2 : Nominal height from back face of housing washer to back face of center washer on double direction thrust ball bearings, or nominal effective outer ring width of tapered roller bearing.
- r : Chamfer dimensions of inner and outer rings (for tapered roller bearings, large end of inner ring only)
- r_1 : Chamfer dimensions of center washer, or small end of inner and outer ring of angular contact ball bearing, and large end of outer ring of tapered roller bearing.
- r_2 : Chamfer dimensions of small end of inner and outer rings of tapered roller bearing

Dimension Deviation

- Δ_{ds} : Single bore diameter deviation
- Δ_{dmp} : Single plane mean bore diameter deviation
- Δ_{d2mp} : Single plane mean bore diameter deviation (double direction thrust ball bearing)
- Δ_{ds} : Single outside diameter deviation
- Δ_{dmp} : Single plane mean outside diameter deviation
- Δ_{Bs} : Inner ring width deviation, or Centre washer height deviation
- Δ_{Cs} : Outer ring width deviation
- Δ_{Ts} : Overall width deviation of assembled single row tapered roller bearing, or height deviation of single direction thrust bearing
- Δ_{T1s} : Height deviation of double direction thrust ball bearing, or effective width deviation of roller and inner ring assembly of tapered roller bearing
- Δ_{T2s} : Double direction thrust ball bearing housing washer back face to center washer back face height deviation, or tapered roller bearing outer ring effective width deviation

Dimension Variation

- V_{dp} : Single radial plane bore diameter variation
- V_{d2p} : Single radial plane bore diameter variation (double direction thrust ball bearing)
- V_{dmp} : Mean single plane bore diameter variation
- V_{Dp} : Single radial plane outside diameter variation
- V_{Dmp} : Mean single plane outside diameter variation
- V_{Bs} : Inner ring width variation
- V_{Cs} : Outer ring width variation

Chamfer Boundary

- $r'_{s \min}$: Minimum allowable chamfer dimension for inner/outer ring, or small end of inner ring on tapered roller bearing
- $r'_{s \max}$: Maximum allowable chamfer dimension for inner/outer ring, or large end of inner ring on tapered roller bearing
- $r'_{1s \min}$: Minimum allowable chamfer dimension for double direction thrust ball bearing center washer, small end of inner/outer ring of angular contact ball bearing, large end of outer ring of tapered roller bearing
- $r'_{1s \max}$: Maximum allowable chamfer dimension for double direction thrust ball bearing center washer, small end of inner/outer ring of angular contact ball bearing, large end of outer ring of tapered roller bearing
- $r'_{2s \min}$: Minimum allowable chamfer dimension for small end of inner/outer ring of tapered roller bearing
- $r'_{2s \max}$: Maximum allowable chamfer dimension for small end of inner/outer ring of tapered roller bearing

Rotation Tolerance

- K_{io} : Inner ring radial runout
- S_{io} : Inner ring axial runout (with side)
- S_d : Face runout with bore
- K_{eo} : Outer ring radial runout
- S_{eo} : Outer ring axial runout
- S_d : Outside surface inclination
- S_i : Thrust bearing shaft washer raceway (or center washer raceway) thickness variation
- S_e : Thrust bearing housing washer raceway thickness variation

Table 3.3 Tolerance for radial bearings (Except tapered roller bearings)
Inner Rings

Nominal bore diameter <i>d</i> (mm) over incl		Δ_{dmp}										V_{dp}															
												diameter series 7.8.9					diameter series 0.1					diameter series 2.3.4					
		class 0		class 6		class 5		class 4		class 2		class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2	
		high	low	high	low	high	low	high	low	high	low	Max				Max				Max				Max			
0.61	2.5	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5	6	5	4	3	2.5	
2.5	10	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5	6	5	4	3	2.5	
10	18	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5	6	5	4	3	2.5	
18	30	0	-10	0	-8	0	-6	0	-5	0	-2.5	13	10	6	5	2.5	10	8	5	4	2.5	8	6	5	4	2.5	
30	50	0	-12	0	-10	0	-8	0	-6	0	-2.5	15	13	8	6	2.5	12	10	6	5	2.5	9	8	6	5	2.5	
50	80	0	-15	0	-12	0	-9	0	-7	0	-4	19	15	9	7	4	19	15	7	5	4	11	9	7	5	4	
80	120	0	-20	0	-15	0	-10	0	-8	0	-5	25	19	10	8	5	25	19	8	6	5	15	11	8	6	5	
120	150	0	-25	0	-18	0	-13	0	-10	0	-7	31	23	13	10	7	31	23	10	8	7	19	14	10	8	7	
150	180	0	-25	0	-18	0	-13	0	-10	0	-7	31	23	13	10	7	31	23	10	8	7	19	14	10	8	7	
180	250	0	-30	0	-22	0	-15	0	-12	0	-8	38	28	15	12	8	38	28	12	9	8	23	17	12	9	8	
250	315	0	-35	0	-25	0	-18	-	-	-	-	44	31	18	-	-	44	31	14	-	-	26	19	14	-	-	
315	400	0	-40	0	-30	0	-23	-	-	-	-	50	38	23	-	-	50	38	18	-	-	30	23	18	-	-	
400	500	0	-45	0	-35	-	-	-	-	-	-	56	44	-	-	-	56	44	-	-	-	34	26	-	-	-	
500	630	0	-50	0	-40	-	-	-	-	-	-	63	50	-	-	-	63	50	-	-	-	38	30	-	-	-	
630	800	0	-75	-	-	-	-	-	-	-	-	94	-	-	-	-	94	-	-	-	-	55	-	-	-	-	
800	1000	0	-100	-	-	-	-	-	-	-	-	-	125	-	-	-	-	125	-	-	-	-	75	-	-	-	
1000	1250	0	-125	-	-	-	-	-	-	-	-	-	155	-	-	-	-	155	-	-	-	-	94	-	-	-	
1250	1600	0	-160	-	-	-	-	-	-	-	-	-	200	-	-	-	-	200	-	-	-	-	120	-	-	-	
1600	2000	0	-200	-	-	-	-	-	-	-	-	-	250	-	-	-	-	250	-	-	-	-	150	-	-	-	

Table 3.3.2 Outer rings

Nominal bore diameter D (mm) over incl	Δ_{Dmp}										V_{Dp}														
	class 0		class 6		class 5		class 4		class 2		diameter series 7.8.9					diameter series 0.1					diameter series 2.3.4				
	high	low	high	low	high	low	high	low	high	low	class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2
2.5 6	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5	6	5	4	3	2.5
6 18	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5	6	5	4	3	2.5
18 30	0	-9	0	-8	0	-6	0	-5	0	-4	12	10	6	-	4	9	8	5	4	4	7	6	5	4	4
30 50	0	-11	0	-9	0	-7	0	-6	0	-4	14	11	7	-	4	11	9	5	5	4	8	7	5	5	4
50 80	0	-13	0	-11	0	-9	0	-7	0	-4	16	14	9	7	4	13	11	7	5	4	10	8	7	5	4
80 120	0	-15	0	-13	0	-10	0	-8	0	-5	19	16	10	-	5	19	16	8	6	5	11	10	8	6	5
120 150	0	-18	0	-15	0	-11	0	-9	0	-5	23	19	11	-	5	23	19	8	7	5	14	11	8	7	5
150 180	0	-25	0	-18	0	-13	0	-10	0	-7	31	23	13	-	7	31	23	10	8	7	19	14	10	8	7
180 250	0	-30	0	-20	0	-15	0	-11	0	-8	38	25	15	11	8	38	25	11	8	8	23	15	11	8	8
250 315	0	-35	0	-25	0	-18	0	-13	0	-8	44	31	18	13	8	44	31	14	10	8	26	19	14	10	8
315 400	0	-40	0	-28	0	-20	0	-15	0	-10	50	35	20	15	10	50	35	15	11	10	30	21	15	11	10
400 500	0	-45	0	-33	0	23	-	-	-	-	56	41	23	-	-	56	41	17	-	-	34	25	17	-	-
500 630	0	-50	0	-38	0	-28	-	-	-	-	63	48	28	-	-	63	48	21	-	-	38	29	21	-	-
630 800	0	-75	0	-45	0	-35	-	-	-	-	94	56	35	-	-	94	56	26	-	-	55	34	26	-	-
800 1000	0	-100	0	-60	-	-	-	-	-	-	125	75	-	-	-	125	75	-	-	-	75	45	-	-	-
1000 1250	0	-125	-	-	-	-	-	-	-	-	155	-	-	-	-	155	-	-	-	-	94	-	-	-	-
1250 1600	0	-160	-	-	-	-	-	-	-	-	200	-	-	-	-	200	-	-	-	-	120	-	-	-	-
1600 2000	0	-200	-	-	-	-	-	-	-	-	250	-	-	-	-	250	-	-	-	-	150	-	-	-	-
2000 2500	0	-250	-	-	-	-	-	-	-	-	310	-	-	-	-	310	-	-	-	-	190	-	-	-	-

Unit μm

V_{dmp}					K_{ia}					S_{D}			$S_{\text{ia}}^{(1)}$			Δ_{Bs}						V_{Bs}					
class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2	class 5	class 4	class 2	class 5	class 4	class 2	class 0.6	Δ_{Bs}		class 5.4	class 2		class 0	class 6	class 5	class 4	class 2	
Max					Max					Max			Max			high	low	high	low	high	low	Max					
6	5	3	2	1.5	10	5	4	2.5	1.5	7	3	1.5	7	3	1.5	0	-40	0	-40	0	-40		12	12	5	2.5	1.5
6	5	3	2	1.5	10	6	4	2.5	1.5	7	3	1.5	7	3	1.5	0	-120	0	-40	0	-40		15	15	5	2.5	1.5
6	5	3	2	1.5	10	7	4	2.5	1.5	7	3	1.5	7	3	1.5	0	-120	0	-80	0	-80		20	20	5	2.5	1.5
8	6	3	2.5	1.5	13	8	4	3	2.5	8	4	1.5	8	4	2.5	0	-120	0	-120	0	-120		20	20	5	2.5	1.5
9	8	4	3	1.5	15	10	5	4	2.5	8	4	1.5	8	4	2.5	0	-120	0	-120	0	-120		20	20	5	3	1.5
11	9	5	3.5	2	20	10	5	4	2.5	8	5	1.5	8	5	2.5	0	-150	0	-150	0	-150		25	25	6	4	1.5
15	11	5	4	2.5	25	13	6	5	2.5	9	5	2.5	9	5	2.5	0	-200	0	-200	0	-200		25	25	7	4	2.5
19	14	7	5	3.5	30	18	8	6	2.5	10	6	2.5	10	7	2.5	0	-250	0	-250	0	-250		30	30	8	5	2.5
19	14	7	5	3.5	30	18	8	6	5	10	6	4	10	7	5	0	-250	0	-250	0	-300		30	30	8	5	4
23	17	8	6	4	40	20	10	8	5	11	7	5	13	8	5	0	-300	0	-300	0	-350		30	30	10	6	5
26	19	9	-	-	50	25	13	-	-	13	-	-	15	-	-	0	-350	0	-350	-	-		35	35	13	-	-
30	23	12	-	-	60	30	15	-	-	15	-	-	20	-	-	0	-400	0	-400	-	-		40	40	15	-	-
34	26	-	-	-	65	35	-	-	-	-	-	-	-	-	-	0	-450	-	-	-	-		50	45	-	-	-
38	30	-	-	-	70	40	-	-	-	-	-	-	-	-	-	0	-500	-	-	-	-		60	50	-	-	-
55	-	-	-	-	80	-	-	-	-	-	-	-	-	-	-	0	-750	-	-	-	-		70	-	-	-	-
75	-	-	-	-	90	-	-	-	-	-	-	-	-	-	-	0	-1 000	-	-	-	-		80	-	-	-	-
94	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	0	-1 250	-	-	-	-		100	-	-	-	-
120	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-	0	-1 600	-	-	-	-		120	-	-	-	-
150	-	-	-	-	140	-	-	-	-	-	-	-	-	-	-	0	-2 000	-	-	-	-		140	-	-	-	-

(1) To be applied for deep groove ball bearing and angular contact ball bearings.

Unit μm

$V_{\text{dp}}^{(2)}$ capped bearings diameter series class 0 class 6	V_{Dmp}					K_{sa}					S_{D}			S_{sa}			Δ_{Cs} all type Max	V_{Cs}				
class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2	class 5	class 4	class 2	class 5	class 4	class 2	class 5	class 4	class 2	class 0.6	class 5	class 4	class 2
Max	Max					Max					Max			Max				Max				
10	9	6	5	3	2	1.5	15	8	5	3	1.5	8	4	1.5	8	5	1.5	identical to	identical to	5	2.5	1.5
10	9	6	5	3	2	1.5	15	8	5	3	1.5	8	4	1.5	8	5	1.5	Δ_{Bs} of inner	Δ_{Bs} and Δ_{Bs}	5	2.5	1.5
12	10	7	6	3	2.5	2	15	9	6	4	2.5	8	4	1.5	8	5	2.5	ring of same	of inner ring	5	2.5	1.5
16	13	8	7	4	3	2	20	10	7	5	2.5	8	4	1.5	8	5	2.5	bearing	of same	5	2.5	1.5
20	16	10	8	5	3.5	2	25	13	8	5	4	8	4	1.5	10	5	4		bearing	6	3	1.5
26	20	11	10	5	4	2.5	35	18	10	6	5	9	5	2.5	11	6	5			8	4	2.5
30	25	14	11	6	5	2.5	40	20	11	7	5	10	5	2.5	13	7	5			8	5	2.5
38	30	19	14	7	5	3.5	45	23	13	8	5	10	5	2.5	14	8	5			8	5	2.5
-	-	23	15	8	6	4	50	25	15	10	7	11	7	4	15	10	7			10	7	4
-	-	26	19	9	7	4	60	30	18	11	7	13	8	5	18	10	7			11	7	5
-	-	30	21	10	8	5	70	35	20	13	8	13	10	7	20	13	8			13	8	7
-	-	34	25	12	-	-	80	40	23	-	-	15	-	-	23	-	-			15	-	-
-	-	38	29	14	-	-	100	50	25	-	-	18	-	-	25	-	-			18	-	-
-	-	55	34	18	-	-	120	60	30	-	-	20	-	-	30	-	-			20	-	-
-	-	75	45	-	-	-	140	75	-	-	-	-	-	-	-	-	-			-	-	-
-	-	94	-	-	-	-	160	-	-	-	-	-	-	-	-	-	-			-	-	-
-	-	120	-	-	-	-	190	-	-	-	-	-	-	-	-	-	-			-	-	-
-	-	150	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-			-	-	-
-	-	190	-	-	-	-	250	-	-	-	-	-	-	-	-	-	-			-	-	-

(2) To be applied in case snap rings are not installed on the bearings.

Table 3.4 Tolerance of tapered roller bearings (Metric)
Inner rings

Nominal bore diameter d (mm) over incl.		Δ_{dmp} class 0.6x class 5,6 class 4 high low high low high low						V_{dp} class 0.6x class 6 class 5 class 4 Max				V_{dmp} class 0.6x class 6 class 5 class 4 Max				K_{ia} class 0.6x class 6 class 5 class 4 Max				S_d class 5 class 4 Max	
10	18	0	-12	0	-7	0	-5	12	7	5	4	9	5	5	4	15	7	5	3	7	3
18	30	0	-12	0	-8	0	-6	12	8	6	5	9	6	5	4	18	8	5	3	8	4
30	50	0	-12	0	-10	0	-8	12	10	8	6	9	8	5	5	20	10	6	4	8	4
50	80	0	-15	0	-12	0	-9	15	12	9	7	11	9	6	5	25	10	7	4	8	5
80	120	0	-120	0	-15	0	-10	20	15	11	8	15	11	8	5	30	13	8	5	9	5
120	180	0	-25	0	-18	0	-13	25	18	14	10	19	14	9	7	35	18	11	6	10	6
180	250	0	-30	0	-22	0	-15	30	22	17	11	23	16	11	8	50	20	13	8	11	7
250	315	0	-35	-	-	-	-	35	-	-	-	26	-	-	-	60	-	-	-	-	-
315	400	0	-40	-	-	-	-	40	-	-	-	30	-	-	-	70	-	-	-	-	-
400	500	0	-45	-	-	-	-	45	-	-	-	34	-	-	-	80	-	-	-	-	-
500	630	-	-50	-	-	-	-	50	-	-	-	38	-	-	-	90	-	-	-	-	-
630	800	0	-75	-	-	-	-	75	-	-	-	56	-	-	-	105	-	-	-	-	-
800	1000	0	-100	-	—	-	-	100	-	-	-	75	-	-	-	120	-	-	-	-	-

Outer rings

Nominal outside diameter D (mm) over incl.		Δ_{Dmp} class 0.6x class 5,6 class 4 high low high low high low						V_{Dp} class 0.6x class 6 class 5 class 4 Max				V_{Dmp} class 0.6x class 6 class 5 class 4 Max				K_{ea} class 0.6x class 6 class 5 class 4 Max				S_D class 5 class 4 Max	
18	30	0	-12	0	-8	0	-6	12	8	6	5	9	6	5	4	18	9	6	4	8	4
30	50	0	-14	0	-9	0	-7	14	9	7	5	11	7	5	5	20	10	7	5	8	4
50	80	0	-16	0	-11	0	-9	16	11	8	7	12	8	6	5	25	13	8	5	8	4
80	120	0	-18	0	-13	0	-10	18	13	10	8	14	10	7	5	35	18	10	6	9	5
120	150	0	-20	0	-15	0	-11	20	15	11	8	15	11	8	6	40	20	11	7	10	5
150	180	0	-25	0	-18	0	-13	25	18	14	10	19	14	9	7	45	23	13	8	10	5
180	250	0	-30	0	-20	0	-15	30	20	15	11	23	15	10	8	50	25	15	10	11	7
250	315	0	-35	0	-25	0	-18	35	25	19	14	26	19	13	9	60	30	18	11	13	8
315	400	0	-40	0	-28	0	-20	40	28	22	15	30	21	14	10	70	35	20	13	13	10
400	500	0	-45	-	-	-	-	45	-	-	-	34	-	-	-	80	-	-	-	-	-
500	630	0	-50	-	-	-	-	50	-	-	-	38	-	-	-	100	-	-	-	-	-
630	800	0	-75	-	-	-	-	75	-	-	-	56	-	-	-	120	-	-	-	-	-
800	1 000	0	-100	-	-	-	-	100	-	-	-	75	-	-	-	140	-	-	-	-	-
1 000	1 250	0	-125	-	-	-	-	125	-	-	-	84	-	-	-	165	-	-	-	-	-
1 250	1 600	0	-160	-	-	-	-	160	-	-	-	120	-	-	-	190	-	-	-	-	-

Unit μm

S_{ia} class 4 max	Δ_{Br}						Δ_{Ts}						$\Delta_{B1s}, \Delta_{C1s}$			$\Delta_{B2s}, \Delta_{C2s}$		
	class 0.6 high low		class 6X high low		class 4,5 high low		class 0.6 high low		class 6X high low		class 4,5 high low		class 0, 6, 5 high low			class 0, 6, 5 high low		
3	0	-120	0	-50	0	-200	+200	0	+100	0	+200	-200	-	-		-	-	
4	0	-120	0	-50	0	-200	+200	0	+100	0	+200	-200	-	-		-	-	
4	0	-120	0	-50	0	-240	+200	0	+100	0	+200	-200	+240	-240		-	-	
4	0	-150	0	-50	0	-300	+200	0	+100	0	+200	-200	+300	-300		-	-	
5	0	-200	0	-50	0	-400	+200	-200	+100	0	+200	-200	+400	-400		+500	-500	
7	0	-250	0	-50	0	-500	+350	-250	+150	0	+350	-250	+500	-500		+600	-600	
8	0	-300	0	-50	0	-600	+350	-250	+150	0	+350	-250	+600	-600		+750	-750	
-	0	-350	0	-50	-	-	+350	-250	+200	0	-	-	+700	-700		+900	-900	
-	0	-400	0	-50	-	-	+400	-400	+200	0	-	-	+800	-800		+1 000	-1 000	
-	0	-450	-	-	-	-	-	-	-	-	-	-	+900	-900		+1 200	-1 200	
-	0	-500	-	-	-	-	-	-	-	-	-	-	+1 000	-1 000		+1 200	-1 200	
-	0	-750	-	-	-	-	-	-	-	-	-	-	+1 500	-1 500		+1 500	-1 500	
-	0	-1 000	-	-	-	-	-	-	-	-	-	-	+1 500	-1 500		+1 500	-1500	

Unit μm

S_{ea} class 4 max	Δ_{Cs}			
	class 0, 6, 5, 4 high		class 6X low high	
low				
5	Identical to Δ_{Bs}		0	-100
5	inner ring of		0	-100
5	same bearing		0	-100
6			0	-100
7			0	-100
8			0	-100
10			0	-100
13			0	-100
-			0	-100

Effective width of outer and inner withroller

Unit μm

Nominal bore diameter d (mm) over incl.		Δ_{R1s}				Δ_{R2s}			
		class 0 high low		class 6X high low		class 0 high low		class 6X high low	
10	18	+100	0	+50	0	+100	0	+50	0
18	30	+100	0	+50	0	+100	0	+50	0
30	50	+100	0	+50	0	+100	0	+50	0
50	80	+100	0	+50	0	+100	0	+50	0
80	120	+100	-100	+50	0	+100	-100	+50	0
120	180	+150	-150	+50	0	+200	-100	+100	0
180	250	+150	-150	+50	0	+200	-100	+100	0

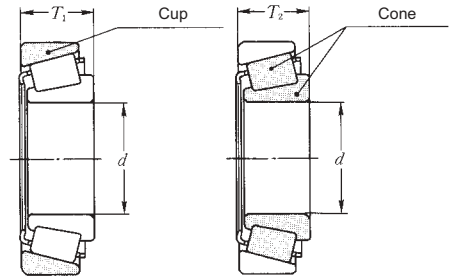


Table 3.7 Tolerance of thrust ball bearings
Inner rings

		$\Delta_{dmp}, \Delta_{d2mp}$				V_{dP}, V_{d2D}		$S_2^{(2)}$			
over	incl.	class 0, 6, 5 high low	high	class 4 low	low	class 0, 6, 5 max	class 4	class 0	class 6 max	class 5	class 4
-	18	0	-8	0	-7	6	5	10	5	3	2
18	30	0	-10	0	-8	8	6	10	5	3	2
30	50	0	-12	0	-10	9	8	10	6	3	2
50	80	0	-15	0	-12	11	9	10	7	4	3
80	120	0	-20	0	-15	15	11	15	8	4	3
120	180	0	-25	0	-18	19	14	15	9	5	4
180	250	0	30	0	-22	23	17	20	10	5	4
250	315	0	-35	0	-25	26	19	25	13	7	5
315	400	0	-40	0	-30	30	23	30	15	7	5
400	500	0	-45	0	-35	34	26	30	18	9	6
500	630	0	-50	0	-40	38	30	35	21	11	7

1) The division of double type bearings will be in accordance with division "d" of single direction type bearings corresponding to the identical nominal outer diameter of bearings, not according to division "d2"

Outer rings

Nominal outside diameter D (mm)		Δ_{Dmp}				V_{Dp}		$S_2^{(2)}$			
over	incl.	class 0, 6, 5 high low	high	class 4 low	low	class 0, 6, 5 max	class 4	class 0	class 6 max	class 5	class 4
10	18	0	-11	0	-7	8	5	According to the tolerance of S_1 against "d" or "d2" of the same bearings			
18	30	0	-13	0	-8	10	6				
30	50	0	-16	0	-9	12	7				
50	80	0	-19	0	-11	14	8				
80	120	0	-22	0	-13	17	10				
120	180	0	-25	0	-15	19	11				
180	250	0	-30	0	-20	23	15				
250	315	0	-35	0	-25	26	19				
315	400	0	-40	0	-28	30	21				
400	500	0	-45	0	-33	34	25				
500	630	0	-50	0	-38	38	29				
630	800	0	-75	0	-45	55	34				

2) To be applied only for bearings with flat

Height of bearings center washer

Unit μm

Nominal bore diameter d (mm)		Single direction type Δ_{Ts}		Double direction type					
over	incl.	high	low	$\Delta_{T1s^{(3)}}$		$\Delta_{T2s^{(3)}}$		$\Delta_{T3s^{(3)}}$	
-	30	0	-75	+50	-150	0	-75	0	-50
30	50	0	-100	+75	-200	0	-100	0	-75
50	80	0	-125	+100	-250	0	-125	0	-100
80	120	0	-150	+125	-300	0	-150	0	-125
120	180	0	-175	+150	-350	0	-175	0	-150
180	250	0	-200	+175	-400	0	-200	0	-175
250	315	0	-225	+200	-450	0	-225	0	-200
315	400	0	-300	+250	-600	0	-300	0	-250
400	500	0	-350	-	-	-	-	-	-
500	630	0	-400	-	-	-	-	-	-

3) To be in accordance with the division "d" of single direction type bearings corresponding to the identical outer diameter of bearings in the same bearings series.

Table 3.8 Tolerance of sphrical thrust roller bearing

Inner rings		Unit μm					
Nominal bore diameter d (mm)		Δ_{dmp}		V_{dp}	S_d	Δ_{Ts}	
over	incl.	high	low	max	max	high	low
50	80	0	-15	11	25	+150	-15
80	120	0	-20	15	25	+200	-200
120	180	0	-25	19	30	+250	-250
180	250	0	-30	23	30	+300	-300
250	315	0	-35	26	35	+350	-300
315	400	0	-40	30	40	+400	-400
400	500	0	-45	34	45	+450	-450

Outer ring		Unit μm	
Nominal bore diameter D (mm)		Δ_{Dmp}	
over	incl.	high	low
120	180	0	-25
180	250	0	-30
250	315	0	-35
315	400	0	-40
400	500	0	-45
500	630	0	-50
630	800	0	-75
800	1 000	0	-100

4. Fits

4.1 Interference

Bearing rings are fixed on the shaft or in the housing so that slip or movement does not occur between the mated surface during operation or under load.

This relative movement, creep, between the fitted surfaces of the bearing and the shaft or housing can occur in a radial direction, or in an axial direction, or in the direction of rotation. This creeping movement under load causes damage to the bearing rings, shaft or housing in the form of abrasive wear, fretting corrosion or friction crack. This can also lead to abrasive particles getting into the bearing, which can cause vibration, excessive heat, and lowered rotational efficiency. To insure that slip does not occur between the fitted surfaces of the bearing rings and the shaft or housing, the bearing is usually installed with an interference fit.

Most effective interference fit is called a tight fit or shrink fit. The advantage of this tight fit for thin walled bearings is that it provides uniform load support over the entire ring circumference without any loss in load carrying capacity.

However, with a tight interference-fit, ease of mounting and dismounting the bearing is lost; and when using a non-separable bearing as a non-fixing bearing, axial displacement is impossible.

4.2 Calculation

Load and interference

The minimum required amount of interference for the inner rings mounted on solid shafts when acted on by radial load, is found by formulae 4.1 and 4.2.

When $F_r \leq 0.3 C_{or}$

$$\Delta d_{ef} = 0.08 \sqrt{\frac{d \cdot F_r}{B}} \dots\dots\dots 4.1$$

When $F_r > 0.3 C_{or}$

$$\Delta d_{ef} = 0.02 \frac{F_r}{B} \dots\dots\dots 4.2$$

Where,

Δd_{ef} : Required effective interference (for load) μm

d : Nominal bore diameter mm

B : Inner ring width mm

F_r : Radial load N

C_{or} : Basic static rated load N

Temperature rise and interference

To prevent loosening of the inner ring on steel shafts due to temperature increases (difference between bearing temperature and ambient temperature) caused by bearing rotation, and interference fit must be given. The required amount of interference can be found by formula (4.3).

$$\Delta d_{dT} = 0.0015 \cdot d \cdot \Delta T \dots\dots\dots 4.3$$

Where,

Δd_{dT} : Required effective interference (for temperature) μm

ΔT : Difference between bearing temperature and ambient temperature $^{\circ}C$

d : Bearing bore diameter mm

Effective interference and apparent interference

The effective interference (the actual interference after fitting) is different from the apparent interference derived from the dimensions measured value. This difference is due to the roughness or slight variations of the mating surfaces, and this slight flattening of the uneven surfaces at the time of fitting is taken into consideration.

The relation between the effective and apparent interference, which varies according to the finish given to the mating surfaces, is expressed by formula (4.4).

$$\Delta d_{eff} = \Delta d_t \cdot G \dots\dots\dots 4.4$$

Where,

Δd_{eff} : Effective interference μm

Δd_t : Apparent interference μm

$G = 1.0 \sim 2.5 \mu m$ for ground shaft

$= 5.0 \sim 7.0 \mu m$ for turned shaft

Maximum interference

When bearing rings are installed with an interference fit on shafts or in housings, tension or compression stress may occur. If the interference is too large, it may cause damage to the bearing rings and reduce the fatigue life of the bearing. For these reasons, the maximum amount of interference should be less than 1/1 000 of the shaft diameter, or

4.3 Selection

Selection of the proper fit is generally based on the following factors: 1) the direction and nature of the bearing load 2) whether the inner ring or outer ring rotates 3) whether the load on the inner or outer ring rotates or not 4) whether there is static load or direction indeterminate load or not.

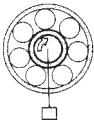
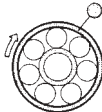
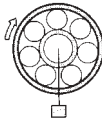
For bearings under rotating loads or direction indeterminate loads, a tight fit is recommended; but for static loads, a transition fit or loose fit should be sufficient.

The interference should be tighter for heavy bearing loads or vibration and shock load conditions. Also, a tighter than normal fit should be given when the bearing is installed on hollow shafts or in housings with thin walls, or housings made of light alloys or plastic.

In applications where high rotational accuracy must be maintained, high precision bearings and high tolerance shafts and housing should be employed instead of a tighter interference fit to ensure bearing stability. High interference fits should be avoided if possible as they cause shaft or housing deformities to be induced into the bearing rings, and thus reduce bearing rotational accuracy.

Because mounting and dismounting become very difficult when both the inner ring and outer ring of a non-separable bearing (for example a deep groove ball bearing) are given tight interference fits, one or the other ring should be given a loose fit.

Table 4.1 Radial Load and bearing fit

Bearing rotation and load	Illustration	Ring load	Fit
Inner ring : Rotating Outer ring : Stationary Load direction: Constant	 Static Load	Rotating inner ring load	Inner ring : Tight Fit
Inner ring : Stationary Outer ring : Rotating Load direction : Rotates with outer ring	 Unbalanced Load	Static outer	Outer ring : Loose fit ring load
Inner ring : Stationary Outer ring : Rotating Load direction : Constant	 Static Load	Static inner ring load	Inner ring : Loose fit
Inner ring : Rotating Outer ring : Stationary Load direction : Rotates with inner ring	 Unbalanced Load	Rotating outer ring load	Outer ring : Tight fit

4.4 Recommended fits

Metric size standard dimension tolerances for bearing shaft diameters and housing bore diameters are governed by ISO 286.

Accordingly, bearing fits are determined by the precision (dimensional tolerance) of the shaft diameter and housing bore diameter. Widely used fits for various shaft and housing bore diameter tolerances, and bearing bore and outside diameters are shown in Fig. 4.1.

Generally, recommended fits relating to the primary factors of bearing shape, dimensions, and load conditions are listed in Tables 4.2 and 4.3.

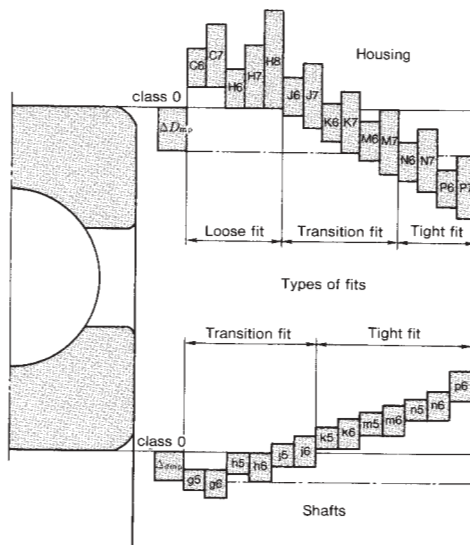


Fig. 4.1

Table 4.2 General standards for radial bearing fits
Housing fit

Housing type	Load condition		Housing fits
Solid or split housing	Outer ring static load	all load conditions	H7
		Heat conducted through shaft	G7
Solid housing	Direction indeterminate load	Light to normal	JS7
		Normal to heavy	K7
		Heavy shock	M7
	Outer ring rotating load	Light or variable	M7
		Normal to heavy	N7
		Heavy (thin wall housing)	P7
		Heavy shock	P7

Note : Fits apply to cast iron or steel housings. For light alloy housings, a tighter fit than listed is required.

Table 4.2 Cylindrical bore radial bearings, Shaft fit

Type of Load	Bearing type	Shaft diameter	Load Type	Shaft Fit
Point load on inner ring	Ball bearings Roller bearings	All sizes	Floating bearings with sliding inner ring	g6 (g5)
			Angular contact ball bearings and tapered roller bearings with adjusted inner ring	h6 (j6)
Circumferential load on inner ring or indeterminate load	Ball bearings	up to 40 mm	normal load	j6 (j5)
		up to 100 mm	low load	j6 (j5)
			normal and high load	k6 (k5)
		up to 200 mm	low load	k6 (k5)
			normal and high load	m6 (m5)
		over 200 mm	normal load	m6 (m5)
			high load, shocks	n6 (n5)
	Roller bearings	up to 60 mm	low load	j6 (j5)
			normal and high load	k6 (k5)
		up to 200 mm	low load	k6 (k5)
			normal load	m6 (m5)
			high load	n6 (n5)
		up to 500 mm	normal load	m6 (n5)
			high load, shocks	p6
		over 500 mm	normal load	n6 (p6)
			high load	p6

Table 4.3 for electric motor bearings, Shaft / Housing fit

Shaft or housing	Deep groove ball bearings		Cylindrical roller bearings			
	Shaft or housing bore diameter mm		Fits	Shaft or housing bore diameter mm		Fits
	over	incl.		over	incl.	
Shaft	-	18	j5	-	40	k5
	18	100	k5	40	160	m5
	100	160	m5	160	200	n5
Housing	All sizes		H6 or J6	All sizes		H6 or J6

5 Clearance

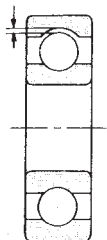
5.1 Internal clearance

Internal clearance of a bearing is the amount of internal clearance a bearing has before being installed on a shaft or in a housing.

As in Fig.5.1, when either the inner ring or the outer ring is fixed and the other ring is free to move, displacement can take place in either an axial or radial direction. This amount of displacement (radially or axially) is termed the internal clearance and, depending on the direction, is called the radial internal clearance or the axial internal clearance.

When the internal clearance of a bearing is measured, a slight measurement load is applied to the raceway so the internal clearance may be measured accurately. However, at this time, a slight amount of elastic deformation of the bearing occurs under the measurement load, and the clearance measurement value is slightly larger than the true clearance. This discrepancy between the true bearing clearance and the increased amount due to the elastic deformation must be compensated for. These compensation values are given in Table 5.1. For roller bearings the amount of elastic deformation can be ignored.

Radial internal clearance



Axial internal clearance

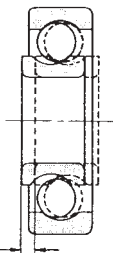


Fig. 5.1 Internal clearance

Table 5.1 Adjustment of radial internal clearance based on measured load Unit μm

Nominal bore diameter of bearing d (mm)		Measuring Load (N)	Radial Clearance Increase				
over	incl		C2	Normal	C3	C4	C5
10	18	24.5	3~4	4	4	4	4
18	50	49	4~5	5	6	6	6
50	200	147	6~8	8	9	9	9

5.2 Internal clearance selection

The internal clearance of a bearing under operating conditions (effective clearance) is usually smaller than the same bearing's initial clearance before being installed and operated. This is due to several factors including bearing fit, the difference in temperature between the inner and outer rings, etc. As a bearing's operating clearance has an effect on bearing life, heat generation, vibration, noise, etc.; care must be taken in selecting the most suitable operating clearance.

Effective internal clearance:

The internal clearance differential between the initial clearance and the operating (effective) clearance (the amount of clearance reduction caused by interference fits, or clearance variation due to the temperature difference between the inner and outer rings) can be calculated by the following formula:

$$\text{When } \delta_{\text{eff}} = \delta_o - (\delta_t + \delta_i) \dots\dots\dots 5.1$$

Where,

- δ_{eff} : Effective internal clearance mm
- δ_o : Bearing internal clearance mm
- δ_t : Reduced amount of clearance due to interference mm
- δ_i : Reduced amount of clearance due to temperature differential of inner and outer rings mm

Reduced clearance due to interference:

When bearings are installed with interference fits on shafts and in housings, the inner ring will expand and the outer ring will contract; thus reducing the bearings' internal clearance. The amount of expansion or contraction varies depending on the shape of the bearing, the shape of the shaft or housing, dimensions of the respective parts, and the type of material used. The differential can range from approximately 70% to 90% of the effective interference.

$$\delta_t = (0.70 \sim 0.90) \cdot \Delta_{\text{def}} \dots\dots\dots 5.2$$

Where,

- δ_t : Reduced amount of clearance due to interference mm
- Δ_{def} : Effective interference mm

Reduced internal clearance due to inner/outer ring temperature difference:

During operation, normally the outer ring will be from 5x to 10xC cooler than the inner ring or rotating parts. However, if the colling effect of the housing is large, the shaft is Connected to a heat source, or a heated

substance is conducted through the hollow shaft; the temperature difference between the two rings can be even greater. The amount of internal clearance is thus further reduced by the differential expansion of the two rings.

$\delta_t = \alpha \cdot \Delta t \cdot D_o$ 5.3

Where,
 δ_t : Amount of reduced clearance due to heat differential mm
 α : Bearing steel linear expansion coefficientn 12.5x10-6/XC
 Δt : Inner/outer ring temperature differential XC
 D_o : Outer ring raceway diameter mm

Outer ring raceway diameter, D_o , values can be approximated by using formula (8.4) or (8.5).

For ball bearings and self-aligning roller bearings,

$D_o = 0.20 (d + 4.0D)$ 5.4

For roller bearings (except self-aligning)

$D_o = 0.25 (d + 3.0D)$ 5.5

Where, d : Bearing bore diameter mm
 D : Bearing outside diameter mm

5.3 Bearing internal clearance seletion standards

Theoretically, as regards bearing life, the optimum operating internal clearance for any bearing would be a slight negative clearance after the bearing had reached normal operating temperature.

Under actual operating conditions, maintaining such optimum tolerances is often difficult at best. Due to various fluctuating operating conditions this slight minus clearance can quickly become a large minus, greatly lowering the life of teh bearing and causing excessive heat to be generated. Therefore, an initial internal clearance which will result in a slightly greater than minus internal operating clearance should be selected.

Under normal operating conditions (e.g. normal load, fit, speed, temperature, etc.), a standard internal cleracne will give a very staisfactory operating clearance.

Table 5.2. lists non-standard clearance recommendations for various applications and operating conditions.

Table 5.2 Examples of applications where bearing clearances other than normal clearance are used

Operating conditions	Applications	Selected clearance
With heavy or shock load, clearance is great.	Railway vehicle axles	C3
	Vibration screens	C3, C4
With direction indeterminate load both inner and outer rings are tight-fitted.	Railway vehicle traction motors	C4
	Tractors and final speed regulators	C4
Shaft or inner ring is heated	Paper making machines and driers	C3, C4
	Rolling mill table rollers	C3
Clearance fit for both inner and outer rings	Rolling mill roll rollers	C2
to reduce noise and vibration when rotating.	Micromotors	C2

Table 5.3 Radial internal clearance of bearing for electric motor

Nominal bore diameter d mm		Radical internal clearance, E			
		Deep groove ball bearings		Cylindrical ²⁾ roller bearings	
over	incl.	min	max	min	max
10	18	4	11	-	-
18	24	5	12	-	-
24	30	5	12	15	30
30	40	9	17	15	30
40	50	9	17	20	35
50	65	12	22	25	40
65	80	12	22	30	45
80	100	18	30	35	55
100	120	18	30	35	60
120	140	24	38	40	65
140	160	24	38	50	80
160	180	-	-	60	90
180	200	-	-	65	100

1) Suffix E is added to bearing numbers.
2) Non-interchangeable clearance.

Table 5.4. Radial internal clearance of deep groove ball bearings.

Unit μm

Nominal bore diameter d mm		C2		Normal		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
-	2.5	0	6	4	11	10	20	-	-	-	-
2.5	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	32	82	82	132	132	187	197	255
225	250	4	36	36	92	92	152	152	217	217	290
250	280	4	39	39	97	97	162	162	237	237	320
280	315	8	50	50	110	110	180	180	260	260	350
315	355	8	50	50	120	120	200	200	290	290	380
355	400	8	60	60	140	140	230	230	330	330	430
400	450	10	70	70	160	160	260	260	370	-	-
450	500	10	80	80	180	180	290	290	410	-	-
500	560	20	90	90	200	200	320	320	460	-	-
560	630	20	100	100	220	220	350	350	510	-	-

Table 5.5 Radial internal clearance of self-aligning ball bearings, cylindrical bore

 Unit μm

Nominal bore diameter d mm		C2		Normal		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
2.5	6	1	8	5	15	10	20	15	25	21	33
6	10	2	9	6	17	12	25	19	33	27	42
10	14	2	10	6	19	13	26	21	35	30	48
14	18	3	12	8	21	15	28	23	37	32	50
18	24	4	14	10	23	17	30	25	39	34	52
24	30	5	16	11	24	19	35	29	46	40	58
30	40	6	18	13	29	23	40	34	53	46	66
40	50	6	19	14	31	25	44	37	57	50	71
50	65	7	21	16	36	30	50	45	69	62	88
65	80	8	24	18	40	35	60	54	83	76	108
80	100	9	27	22	48	42	70	64	96	89	124
100	120	10	31	25	56	50	83	75	114	105	145
120	140	10	38	30	68	60	100	90	135	125	175
140	160	15	44	35	80	70	120	110	161	150	210

Table 5.5 Radial clearance of self-aligning ball bearings, tapered bore

 Unit μm

C2		Normal		C3		C4		C5		Nominal bore diameter d mm	
min	max	min	max	min	max	min	max	min	max	over	incl.
-	-	-	-	-	-	-	-	-	-	2.5	6
-	-	-	-	-	-	-	-	-	-	6	10
-	-	-	-	-	-	-	-	-	-	10	14
-	-	-	-	-	-	-	-	-	-	14	18
7	17	13	26	20	33	28	42	37	55	18	24
9	20	15	28	23	39	33	50	44	62	24	30
12	24	19	35	29	46	40	59	52	72	30	40
14	27	22	39	33	52	45	65	58	79	40	50
18	32	27	47	41	61	56	80	73	99	50	65
23	39	35	57	50	75	69	98	91	123	65	80
29	47	42	68	62	90	84	116	109	144	80	100
35	56	50	81	75	108	100	139	130	170	100	120
40	68	60	98	90	130	120	165	155	205	120	140
45	74	65	110	100	150	140	191	180	240	140	160

Table 5.6.1 Radial internal clearance of spherical roller bearings, cylindrical bore

 Unit μm

Nominal bore diameter d mm		C2		Normal		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
14	18	10	20	20	35	35	45	45	60	60	75
18	24	10	20	20	35	35	45	45	60	60	75
24	30	15	25	25	40	40	55	55	75	75	95
30	40	15	30	30	45	45	60	60	80	80	100
40	50	20	35	35	55	55	75	75	100	100	125
50	65	20	40	40	65	65	90	90	120	120	150
65	80	30	50	50	80	80	110	110	145	145	180
80	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	18	0240	240	310	310	390
180	200	70	130	130	200	200	260	260	340	340	430
200	225	80	14	014	0220	220	290	290	380	380	470
225	250	90	150	150	240	240	320	320	420	420	520
250	280	100	170	170	260	260	350	350	460	460	570
280	315	110	190	190	280	280	370	370	500	500	630
315	355	120	200	200	310	310	410	410	550	550	690
355	400	130	220	220	340	340	450	450	600	600	750
400	450	140	240	240	370	370	500	500	660	660	820
450	500	140	260	260	410	410	550	550	720	720	900
500	560	150	280	280	440	440	600	600	780	780	1 000
560	630	170	310	310	480	480	650	650	850	850	1 100
630	710	190	350	350	530	530	700	700	920	920	1 190
710	800	210	390	390	580	580	770	770	1 010	1 010	1 300
800	900	230	430	430	650	650	860	860	1 120	1 120	1 440
900	1 000	260	480	480	710	710	930	930	1 220	1 220	1 570
1 000	1 120	290	530	530	780	780	1 020	1 330	1 330	1 330	1 720
1 120	1 250	320	580	580	860	860	1 120	1 460	1 460	1 460	1 870
1 250	1 400	350	640	640	950	950	1 240	1 620	1 620	1 620	2 080

Table 5.6.2 Radial internal clearance of spherical roller bearings, tapered bore

 Unit μm

C2		Normal		C3		C4		C5		Nominal bore diameter d mm	
min	max	min	max	min	max	min	max	min	max	over	incl.
-	-	-	-	-	-	-	-	-	-	14	18
15	25	25	35	35	45	45	60	60	75	18	24
20	30	30	40	40	55	55	75	75	95	24	30
25	35	35	50	50	65	65	85	85	105	30	40
30	45	45	60	60	80	80	100	100	130	40	50
40	55	55	75	75	95	95	120	120	160	50	65
50	70	70	95	95	120	120	150	150	200	65	80
55	80	80	110	110	140	140	180	180	230	80	100
65	100	100	135	135	170	170	220	220	280	100	120
80	120	120	160	160	200	200	260	260	330	120	140
90	130	130	180	180	230	230	300	300	380	140	160
100	140	140	200	200	260	260	340	340	430	160	180
110	160	160	220	220	290	290	370	370	470	180	200
120	180	180	250	250	320	320	410	410	520	200	225
140	200	200	270	270	350	350	450	450	570	225	250
150	220	220	300	300	390	390	490	490	620	250	280
170	240	240	330	330	430	430	540	540	680	280	315
190	270	270	360	360	470	470	590	590	740	315	355
210	300	300	400	400	520	520	650	650	820	355	400
230	330	330	440	440	570	570	720	720	910	400	450
260	370	370	490	490	630	630	790	790	1 000	450	500
290	410	410	540	540	680	680	870	870	1 100	500	560
320	460	460	600	600	760	760	980	980	1 230	560	630
350	510	510	670	670	850	850	1 090	1 090	1 360	630	710
390	570	570	750	750	960	960	1 220	1 220	1 500	710	800
440	640	640	840	840	1 070	1 070	1 370	1 370	1 690	800	900
490	710	710	930	930	1 190	1 190	1 520	1 520	1 860	900	1 000
530	770	770	1 030	1 030	1 300	1 300	1 670	1 670	2 050	1 000	1 120
570	830	830	1 120	1 120	1 420	1 420	1 830	1 830	2 250	1 120	1 250
620	910	910	1 230	1 230	1 560	1 560	2 000	2 000	2 470	1 250	1 400

*In some critical applications, it is necessary to use bearings with controlled vibration and frequency. In such case, please contact your FBJ sales or engineering department.

6. Speed and High Temperature Suitability

6.1 Maximum Rotational speed

The permissible rotational speed is given in the Catalogue for two kinds of lubricates: grease and liquid oil. However, it does not mean that the maximum rotational speed is acceptable at any load. The ultimate factor limiting the speed is temperature which depends on friction in the bearing and on the heat removal possibility. The limiting values of rotational speed given in the Catalogue are based on the following assumptions: the operating radial clearance is sufficient to enable compensation of the difference in the linear expansion between the outer and inner rings caused by their being heated to different temperatures; the assembly uses rigid shafts and housings; the lubricant is properly selected. The amount of the maximum permissible load is determined by the temperature factor.

The maximum rotational speed found in the Catalogue can, in certain cases, be exceeded by changing the loading conditions and the lubricant. However, in this case, care must be taken to apply a strictly specified dose of properly selected lubricant and to ensure removal of heat arising from friction. A further significant increase of the above-mentioned maximum rotational speed can be made possible by improvement of the bearings design, primarily that of bearing cages, by developing better lubricants, etc. Whenever problems arise in connection with the operation of bearings at higher rotational speed, please consult our personnel.

6.2 Temperature Suitability

FBJ bearings are heat treated in such a way that they can be used at operating temperatures of up to 120°C. Bearings with polyamide cages can be used operating temperatures of up to 100°C only.

If bearings are designed for operation under high temperature conditions, their life expectancy gets somewhat lower because of reduced hardness and fluctuation of the impact viscosity level. In order to prevent the parts dimensions from being changed, they are additionally tempered at high temperatures exceeding the maximum operating temperatures of bearings. Such bearings carry additional marking symbols placed to the right of the location of the bearing designation. Table contains the values of the selected dynamic load-carrying capacity should be multiplied depending on the bearing operating temperature.

Table 6.1 Speed and High Temperature Suitability

Bearing Operating Temperature, °C	Temperature coefficient
160	0.90
180	0.85
200	0.80
250	0.71
300	0.60

7. Bearing Material

7 Bearing Material

The quality of bearings is influenced, to a large measure, by the properties of the material they are made of.

Rings and rolling elements are fabricated predominantly of through-hardening carbon chromium bearing steel of high cleanliness. On delivery to the plant, all the purchased steel is tested for compliance with the basic technical specifications such as the chemical composition, contamination with non-metallic inclusions, metal structure. The examination is conducted at the plant's specialized laboratories equipped with up-to date apparatus and instruments and manned with highly qualified specialists.

The entire work on heat treatment and machining of the rings and rolling elements is carried out with the use of non-destructive testing facilities, which permits to assure high stability of the technological process.

The plant performs systematic tests of the principal types of the manufactured bearings for fatigue life and, in so doing, checks the basic dynamic load-carrying ratings found in this Catalogue and the quality of the steel used.

7.1 Rings and Balls

Standard material for Rings and Balls is vacuum degassed high carbon chromium bearing steel (SUJ2*) allowing for high efficiency, low torque, low noise level and long bearing life. Bearings require anti-corrosion properties, used stainless steel.

7.2 Cage

Cold rolled steel sheets or strips used for pressed cages and High tensile brass castings or machined steel is used for Machined cages. Polyamide material is used in moulded cages. Bearings require anti-corrosion properties used stainless steel cages.

7.3 Shield

Cold rolled steel sheets or strips is used for standard shields and bearings and require anti-corrosion properties used stainless steel.

7.4 Seal

All FBJ seals are made of molded synthetic nitrile rubber which can withstand the temperatures from -45°C to 125°C.

7.5 Stainless Steel

For bearings requiring anti-corrosion or heat resistance properties, rings and balls are made of martensitic stainless steel (SUS440C)** and this martensitic stainless steel is magnetic type. SUS 304 is used In FBJ Stainless steel Cage and Stainless steel Shield.

Table 7 Chemical Composition of Bearing Materials

MATERIAL	SYMBOL	CHEMICAL COMPOSITION %							Hardness HRC
		C	Si	Mn	P	S	Cr	Mo	
HIGH CARBON CHROMIUM STEEL	SUJ2* or SAE52100 or 100Cr6	0.9~1.10	0.15~0.35	≤ 0.50	≤ 0.025	≤ 0.025	1.30~1.60	0.08	58~65
COLD ROLLED STEEL	SPCC	≤ 0.12	--	≤ 0.50	≤ 0.040	≤ 0.045	--	--	--
STAINLESS STEEL	SUS440C** or AISI440C or X102CrMn17	0.9~1.20	--	--	--	--	16.0~18.0	0.75	58~65

8. Lubrication and storage

8.1 Lubrication

Bearing lubrication reduces friction and wear, acts as a coolant, minimizes contamination, prevents corrosion, and generally extends bearing life. Selecting the best lubricant for your specific application becomes a very important decision; however, choosing from the hundreds available can be an overwhelming task. FBJ's engineering staff is available to help make the right decision for your application.

8.2 Oil Lubrication

Oil is the basic lubricant for ball and roller bearings. The main advantage if an oil lubricant is that there is less bearing torque. The use of synthetic oils such as diesters, silicone polymer, and fluorinated compounds has improved volatility and viscosity characteristics and increased temperature properties.

Table 8.1 Recommended Oils in Industrial Use

Manufacturer	Manufacturer Code	FBJ Suffix	Lubricant Base	Flash Point' C	Viscosity (cSt)	Operating Temperature'C
Anderson Oil Co.	Windsor Lube L-245X	OA01	Diester	215	14 (38°C)	-55~+175
Dow Corning Co.	SH550R	OD01	Methylphenly	316	125 (25°C)	-40~+230
Nihon Oil Co.	Antirust P21 00	ON-1	Mineral	166	13 (40°C)	-20~+115
Shell Oil Co.	Aero Shell Fluid 12	OS01	Diester	235	14 (38°C)	-50~+120
Shell Oil Co.	Aero Shell Fluid 3	OS02	Petroleum	145	10.2 (40°C)	-55~+115
Thenneco Chemicals	Anderol L-40 I D	OT01	Diester	220	12.7 (38°C)	-60~+125

Table 8.2 Greases used in FBJ Bearings

Manufacturer	Manufacturer Code	FBJ Suffix	Thickening agent	Lubricant Base	Drop Point' C	Consistency	Operating Temperature'C Range (°C)
Caltex	Chevron SRI-2	GC01	Urea	Mineral	240	270	-30~+175
Dow Corning	Molykote 33M	GD01	Lithium	Silicone	210	260	-70~+180
	Molykote 44M	GD02	Lithium	Silicone	204	260	-40~+200
	Molykote FS 1292	GD03	Fluorotelomer	Phlorosilicone	232	310	-40~+200
	Molykote FS 3451	GD04	Fluorotelomer	Phlorosilicone	260	285	-40~+230
Esso	Andok B	GB01	Sodium	Mineral	260	285	-40~+120
	Andok C	GB02	Sodium	Mineral	260	205	-20~+120
	Andok 260	GB03	Sodium	Mineral	200	260	-30~+150
	Beacon 325	GB04	Lithium	Diester	193	280	-60~+120
Kyodo Yushi	Multemp PS2	GK01	Lithium	Diester.Mineral	190	275	-55~+130
	Multemp SRL	GK02*	Lithium	Ester	191	245	-40~+150
Nihon Oil	Multinocurea	GM01	Urea	Mineral	260	290	-20~+175
Shell Oil	Alvania No.2	GS01*	Lithium	Mineral	182	272	-25~+120
	Alvania No.3	GS02	Lithium	Mineral	1S3	233	-20~+135
	Alvania RA	GS03	Lithium	Mineral	183	252	-40~+130
	Aero Shell Grease No.7	GS01*	Microgel	Diester	260	288	-73~+149
	Aero Shell Grease No.15A	GS05	Fluorotelomer	Silicone	260	280	-73~+260
Shinetsu Silicone	Silicolube G40M	GS31	Lithium	Silicone	210	260	-30~+200

*These suffixes may not indicated in the bearing or bearing box when numbering.

8.3 Grease Lubrication

For lubrication of rolling bearings, use is mainly made of grease, because the techniques of their employment are more simple, they do not require complicated sealing devices and demand less expenditures for the maintenance of mechanisms. When a machine or a mechanism is stopped, grease does not run off from the bearing but remains there and even seals the assembly isolating it from the surroundings. These and other advantages of greases are so decisive that allow the wear of bearings to be ignored. The use of grease brings about a more rapid wear than when operating with oils due to the accumulation of abrasive particles in the former.

Greases are obtained by solidifying lubricating oils with the aid of various thickening agents. Such silidification agent creates a structural framework of interwoven fibers which imparts plasticity to the lubricating material and retains lubricating oil in its cells.

Grease is well held in place in a bearing, does not flow out under the effect of the force of gravity and resists the action of centrifugal forces attempting to throw lubricant away from the bearing during its rotation. The properties of grease are determined by the composition of the thickening agent.

For rolling bearing lubrication, use is normally made of grease in which mineral oil is solidified with the aid of sodium, calcium or lithium soaps.

Rolling bearings should be filled with grease just immediately before the unit is to be assembled. The decisive reason for this is very stringent requirements to the lubricant purity. The later the lubricant is put in, the lesser the danger of its getting contaminated.

The bearing type or design features of a unit may demand it to be filled with grease at a later stage.

Thus, for instance, if it is necessary to adjust the amount of clearance in bearings with a tapered inner bore, the required measurements can be only performed before the unit is filled with grease. It is also impracticable to put in grease before the bearing is heated for mounting. Preliminary packing a bearing with grease is only recommended when it is impossible to distribute grease over rolling elements and raceways after assembly.

Normally, a bearing as a whole and the free space in the unit housing is only partially filled with grease—from 30 to 50%. However, when using lithium-base lubricants for supports that are not subjected to strong vibration, the free space of the housings can be filled up to 90% disregarding the danger of overheating. When a support is filled with a larger than normal amount of grease, this improves the reliability of protection against contamination and prolongs the support's service life.

High-speed rolling bearings, for example, spindle units of metal-cutting machine tools must be lubricated with a small amount of grease in order to limit the temperature of unit heating. In supports subjected to strong vibration, for example, in the hubs of motor car wheels and in the boxes of railroad car wheels, as well as in vibration machines, grease should fill not more than 60% of the free space.

The technique of packing a bearing unit with grease is selected depending on the bearing type.

Separable bearings (cylindrical, tapered, thrust-type) are filled with grease following the sequence of assembly, applying a thin layer on the raceway of the installed ring and then filling the space between the rolling elements.

In inseparable bearings, for example, in radial and angular contact bearings grease should be stuffed in from both ends. Self-aligning ball bearings and spherical roller bearings can be filled with grease by turning the ring and stuffing the lubricant in between the rolling elements.

8.4 Solid Lubrication

A solid film lubrication can range from simple sacrificial retainers, graphite, or molybdenum disulphide (MoS_2) powders, to complex sputtering or plating. Each type must be engineered for the specific application. They are very useful in areas of temperature extremes, vacuum, radiation, pressure, or harsh environments where conventional lubricants would fail. Solid film lubricants do not deteriorate in storage.

8.5 Storage Of Bearings

Rolling bearings have high-quality working surfaces. Any deterioration of the surface quality results in a premature wear and reduction in the service life of bearings.

Bearings are made predominantly of ferrous metals, therefore, the main danger for them is corrosion which is absolutely intolerable on the working surfaces of bearings. To prevent in-storage corrosion, bearings are delivered to the customer in a preserved state, i.e., washed to remove dirt, contamination, slushed with corrosion-protective lubricant - mineral oil with an inhibitor, and packed in special packing.

The time this lubricant will be capable of protecting the bearing against corrosion depends on storage conditions. The customer's task is to store bearings in conformity to the Manufacturer's instructions.

The occurrence of corrosion of bearings during storage depends on two main factors:

1) relative air humidity in the storage place: the lower the humidity, the weaker the process of corrosion. No in-storage corrosion is practically observed when relative humidity is below 40%

2) temperature gradient in the storage premises during the day. The smaller the temperature difference, the more favorable the storage conditions. Great temperature fluctuations are particularly dangerous when there is a high relative humidity. In this case moisture can condense on the surfaces of bearings, increasing sharply the probability of corrosion. These factors need to be considered when establishing requirements to bearing storage premises.

A room used for storage of bearings must be dry, heated, well ventilated, located far from places where the air contains trings of substances that cause metal corrosion-away from chemical, pickling, galvanic shops. The storage room air temperature must be kept, as far as possible, within 10 to 30°C. The daily temperature variation should not exceed 5°C.

Relative air humidity in the storage room should not be in excess of 60%. It is desirable that it should be as low as possible. The bearing storage conditions in the room (humidity and temperature) should be continuously monitored.

It is recommended to store large-size bearings with an inner diameter over 200mm placed on their end-faces to avoid possible deformation of the thin-walled rings.

9. Mounting And Dismounting

9.1 Mounting

Ball and roller bearings should be mounted by qualified personnel paying special attention to keeping them clean: this is very important for ensuring satisfactory operation of bearings and preventing their premature breakdown.

9.2 Preparation of Mounting

The mounting should be preferably done in a room with dry clean air located far from the sources of dust, emulsion, dirt. The shaft and housing surfaces mating with the bearings should be thoroughly washed with gasoline or kerosene, wiped, dried and coated with a thin layer of lubricant. Care must be taken to check the accuracy of dimensions and shapes of all the parts mating with the bearing; they should not exceed the dimensions.

The manufacturer's packing is to be removed from the bearings immediately before mounting to prevent penetration of dirt. Preservative coating is removed from the mounting surfaces only. The mounting surfaces are to be washed with gasoline or kerosene and wiped dry with clean nap-free cloth. If a bearing is dirty or its packing is damaged, it should be thoroughly washed prior to mounting. The mounting surfaces in this case are to be lubricated with medium-viscosity oil.

Prior to mounting, check the bearing appearance, marking, ease of rotation, clearances for compliance with the requirements of the technical documents and this Catalogue.

Radial clearance in spherical roller bearings are measured with the aid of a set of feeler gauges, or by other methods. Feeler gauges are used to measure clearances between the outer ring and the unloaded roller. Prior to mounting, bearings, especially those with the ratio of the length and the largest shaft diameter exceeding 8, must be tested for straightness (absence of bending).

9.3 Mounting of bearings

The method of bearings mounting (mechanical, hydraulic, thermal) depends on their type and size. In all the cases, it is very important to protect rings, bearing cages, rolling elements against direct knocks, because they can damage the bearings. The principal rule to be observed when mounting a bearing is never

to allow the compressing force to be transferred through rolling elements.

When mounting a bearing, it is necessary to ensure the required precision of the bearing rings location with respect to the rotation axis which mainly depends on the absence of misalignment. Misalignments of rings is one of the factors causing initial damages of bearings and concentration of contact stresses. The operating misalignment of the rings should not exceed 0.7 maximum design-permissible angle of alignment of the bearing rings under normal operating conditions (this parameter is to be taken from the description of bearing groups).

It should be borne in mind that the outer ring of a spherical radial bearing has the property of readily swivel out. To replace the ring in its original position, it is necessary to set the dislocated (braking) rollers, with the aid of fingers, back into the outer ring and restore the latter to its original position. NEVER knock on the ring or rollers with a hammer.

9.4 Bearings with Cylindrical Bore

When mounting inseparable bearings, usually the ring with a tighter fit is to be mounted the first. If pre-loading in the tight fit is not too high, small-size bearings can be mounted by knocking lightly with a hammer on

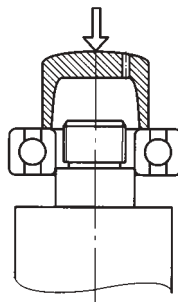


Figure 9.1

the sleeve installed on the front end or the bearings ring.

Knocks should be uniformly distributed over the circumference to prevent the bearing from misalignment. When an aligning bar is used instead of the sleeve, the force must be applied at the center

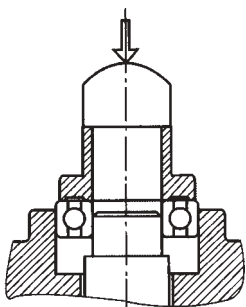


Figure 9.2

(see Figure 9.1). If the bearing is inseparable, it should be simultaneously pressure-fitted onto the shaft and into the housing seat (see Figure 9.2) with the aid of the mounting tool shown in the sketch, a mounting ring is inserted between the bearing and aligning bar, resting on the front ends of the inner and outer rings. The supporting surfaces of the mounting ring should lie in the same plane to ensure even distribution of the forces applied to both Rings during the mounting procedure. When mounting self-

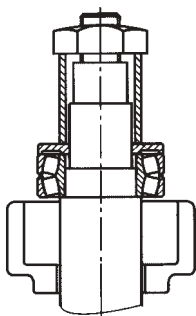


Figure 9.3

aligning bearings, for example, spherical roller bearings, the use of an intermediate mounting rings permits to prevent misalignment and turning of the outer ring after the bearing with the shaft has been installed in the housing seat (see Figure 9.3).

The intermediate mounting ring must have a groove to keep it from touching the rolling elements or bearing cages. Bearings having a diameter of up to 100 mm can be pressure-fitted onto the shaft in cold state with the use of mechanical or hydraulic presses.

The inner ring of a separable bearing can be mounted independently of the outer ring. When

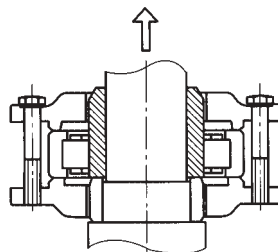


Figure 9.4

mounting a shaft already carrying the inner ring into the housing with the outer ring care should be taken to make them properly centered, otherwise the raceways, balls or rollers can get scored. That is why, when mounting bearings with needle and cylindrical

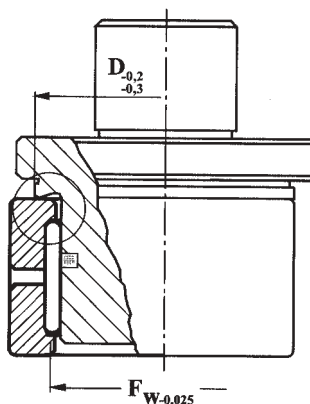
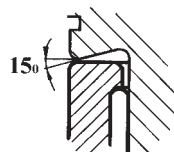


Figure 9.5

rollers, it is recommended to use a mounting sleeve (see Figure 9.4). The outer diameter of the sleeve must be equal to the raceway diameter F of the inner ring machined with a d10 accuracy. The values of F are given in the bearings table. Needle roller bearings with a die-stamped outer ring best mounted with the aid of a special aligning bar (see Figure 9.5).

Large-size bearings or those with tight fit should be heated before mounting. NEVER pre-heat bearings in excess of 120°C, for this may cause changes of both the bearing material, as well as possible burning or deformation of polyamide bearing cages. DO NOT pre-heat bearings having protective shields or seals, because they are filled with grease.

When pre-heating bearings, care should be taken to avoid local overheating. Uniform safe heating can be achieved with the aid of electric heaters, heating furnaces and oil bath.

It is also recommended to use special electric induction heaters. Here the bearing (ring) is heated by an alternating magnetic field which gives rise to eddy currents. After induction heating the bearings (rings) need to be demagnetized.

9.5 Bearings with Tapered Bore

Inner rings of tapered-bore bearings are always mounted with a tight fit. The amount of interference in this case is determined not by the shaft size tolerances as for cylindrical-bore bearings, but by shifting the bearings along the conical surface of the shaft mounting journal, of adapter or withdrawal sleeve.

Double-row spherical roller bearings with tapered bore are mounted onto cylindrical shaft with the aid of adapter or withdrawal sleeves, while on tapered-journal shafts they are installed directly on the shaft. Before mounting, the washed bearing bore and the sleeve may be covered with a thin coat of lubricant. A thicker lubricant layer will reduce friction and, in so doing, facilitate mounting, but in the course of operation the lubricant will be pressed out from the mounting joints. As a result, the fit will lose tightness and the ring or the sleeve will run wearing out the mounting surfaces.

It is a good practice to mount bearings with the bore of up to 70 mm and normal tightness using a hammer and a mounting sleeve screwed onto the threaded shaft end. The pressure part acts on the adapter sleeve end or directly on the inner ring end-face (when mounting is carried out without adapter and withdrawal sleeves). Bearings with a diameter exceeding 100 mm should be mounted using a hydraulic formed (expanded) along with the axial shift of the adapter sleeve.

When any previously dismantled bearing is to be mounted again, it is not sufficient to restore the lock nut to its original position, because after a prolonged operation the radial clearance fit loose due to the wear of the thread and smoothing of the mounting seats,

the shift gets longer. For self-aligning spherical roller bearings the values of the decrease in the original radial clearance which are necessary to ensure a tight static fit. The radial clearance of spherical roller bearings is measured with the use of feeler gauges in both roller rows simultaneously. It is necessary to observe that the rollers are pressed against the middle flange (a guiding lip). The outer and inner rings should be located so as to ensure equal radial clearance for both rows.

The method of mounting bearings is selected based on the mounting conditions.

Small and medium-size bearings can be fitted onto the mounting seats with the aid of the lock nut. The nut is tightened using a box wrench (see Figure 9.6).

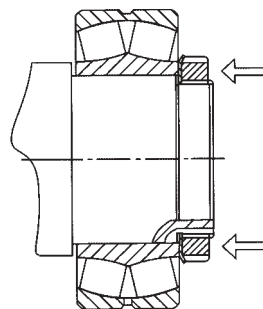


Figure 9.6

Small-size bearings with an adapter sleeve are mounted onto the tapered surface of the adapter sleeve with the aid of the lock nut (see Figure 9.7).

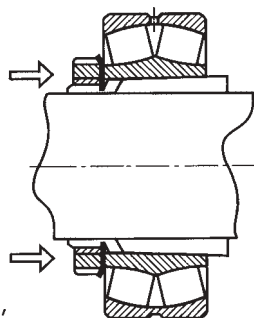


Figure 9.7

Small-size withdrawal sleeves are pressure-fitted with the aid of the lock nut into the gap between the shaft and the inner ring (see Figure 9.8).

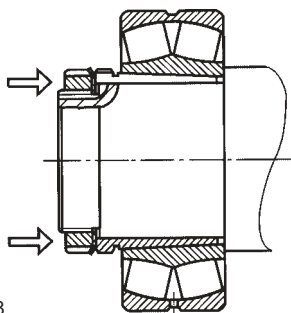


Figure 9.8

The nuts of larger-size bearings require a greater tightening force. In these cases mounting can be made easier with the use of a nut with thrust bolts shown in Figure 9.9. To prevent the bearing or sleeve from being wedged, it is necessary to screw up the

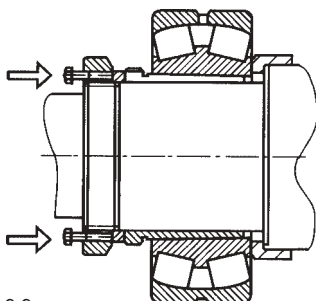


Figure 9.9

nut preliminarily until it comes fully against the mounting sleeve. The thrust bolts made of improved steel and located evenly along the circumference (the number of bolts depends on the force required) are screwed in uniformly in a cross manner until the necessary decrease of radial clearance is obtained. Since a tapered mounting surface provides self-braking, the accessory may be, then, removed and the bearing can be fastened tight with its own fastening nut. This principle is applicable for bearings mounted on a sleeve or directly on a tapered journal.

When mounting large-size bearings, a hydraulic accessory, for example, a

circular piston pump, is normally used, to mount a bearing or to press-fit a sleeve (see Figure 9.10). The ring can be shifted axially with the aid of a screw - or hydraulically-operated nut (for large-size bearings). A hydraulically driven nut has

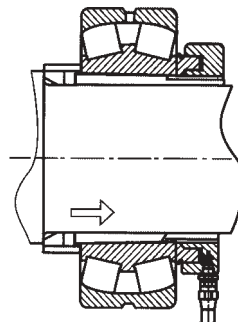


Figure 9.10

a cylindrical groove on one of the ends which serves for insertion of a round piston provided with an O-ring seal. The nut is connected, by means of a hose, with a pump feeding oil to the nut. The pump is a jet-type oil pump with a flexible high pressure hose. The nut piston is moved by oil pressure, then it is extended and pressure-fits the bearing onto the mounting seat.

The most expedient method of mounting large-size bearings (with the bore diameter of over 300-mm) is the use of a hydraulic outward thrust which affords high - quality mounting of a bearing. For this purpose, special channels and grooves are made on the shaft to enable oil to be fed to under the bearing inner ring. When employing hydraulically-aided mounting, pump-driven oil is supplied via the oil-conducting channels and grooves to the contact zone of the bearing inner ring and the shaft. The pressurized oil fed to the contact zone of the rings and the shaft thrusts the ring outwards, thus permitting axial displacement of the ring along the shaft (see Figure 9.11).

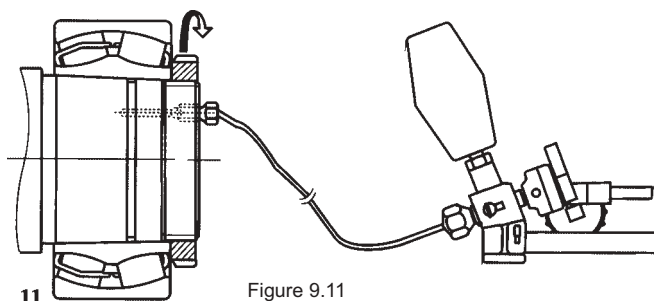


Figure 9.11

Table 9.1 Reduction in Radial Clearance (Gap) Depending on Axial Displacement a Tapered Shaft or Sleeve (Reference)

Bearing bore nominal size, d, mm		Reduction in radial clearance*, mm		Minimum permissible residual clearance ** after mounting of bearing with initial clearance, mm		
Over	Up to	min	max	Normal	Group 3	Group 4
24	30	0.015	0.02	0.015	0.020	0.035
30	40	0.020	0.025	0.015	0.025	0.040
40	50	0.025	0.03	0.020	0.030	0.050
50	65	0.030	0.04	0.025	0.035	0.055
65	80	0.040	0.05	0.025	0.040	0.070
80	100	0.045	0.06	0.035	0.050	0.080
100	120	0.050	0.07	0.050	0.065	0.100
120	140	0.065	0.09	0.055	0.08	0.11
140	160	0.075	0.10	0.055	0.09	0.13
160	180	0.080	0.11	0.06	0.10	0.15
180	200	0.090	0.13	0.07	0.10	0.16
200	225	0.100	0.14	0.08	0.12	0.18
225	250	0.110	0.15	0.09	0.13	0.20
250	280	0.120	0.17	0.10	0.14	0.22
280	315	0.130	0.19	0.11	0.15	0.24
315	355	0.150	0.21	0.12	0.17	0.26
355	400	0.170	0.23	0.13	0.19	0.29
400	450	0.200	0.26	0.13	0.20	0.31
450	500	0.210	0.28	0.16	0.23	0.35
500	560	0.240	0.32	0.17	0.25	0.36
560	630	0.260	0.35	0.20	0.29	0.41
630	710	0.300	0.40	0.21	0.31	0.45
710	800	0.340	0.45	0.23	0.35	0.51
800	900	0.370	0.50	0.27	0.39	0.57
900	1000	0.410	0.55	0.30	0.43	0.64
1000	1120	0.450	0.60	0.32	0.48	0.70
1120	1250	0.490	0.65	0.34	0.54	0.77
1250	1400	0.550	0.72	0.36	0.59	0.84

*Valid for solid steel shafts and hollow shafts with bore diameter of up to half diameter of the shaft, only.

** Bearings with the radial clearance in the upper-half of tolerance limit, prior to mounting, shall be mounted with provision of reduced radial clearance or axial shift at an upper limit; bearings with the radial clearance in the lower half of tolerance limit-with reduced radial clearance or axial shift at lower value.

Axial displacement*, mm							
1:12 Taper				1:30 Taper			
Shaft		Sleeve		Shaft		Sleeve	
min	max	min	max	min	max	min	max
0.30	0.35	0.30	0.40	-	-	-	-
0.35	0.40	0.35	0.45	-	-	-	-
0.40	0.45	0.45	0.50	-	-	-	-
0.45	0.60	0.50	0.70	-	-	-	-
0.6	0.75	0.70	0.85	-	-	-	-
0.7	0.9	0.75	1.0	1.7	2.2	1.8	2.4
0.7	1.1	0.8	1.2	1.9	2.7	2.0	2.8
1.1	1.4	1.2	1.5	2.7	3.5	2.8	3.6
1.2	1.5	1.3	1.7	3.0	4.0	3.1	4.2
1.3	1.7	1.4	1.9	3.2	4.2	3.3	4.6
1.4	2.0	1.5	2.2	3.5	4.5	3.6	5.0
1.6	2.2	1.7	2.4	4.0	5.5	4.2	5.7
1.7	2.4	1.8	2.6	4.2	6.0	4.6	6.2
1.9	2.6	2.0	2.9	4.7	6.7	4.8	6.9
2.0	3.0	2.2	3.2	5.0	7.5	5.2	7.7
2.4	3.4	2.6	3.6	6.0	8.2	6.2	8.4
2.6	3.6	2.9	3.9	6.5	9.0	6.8	9.2
3.1	4.1	3.4	4.4	7.7	10.0	8.0	10.4
3.3	4.4	3.6	4.8	8.2	11.0	8.4	11.2
3.7	5.0	4.1	5.4	9.2	12.5	9.6	12.8
4.0	5.4	4.4	5.9	10.0	13.5	10.4	14
4.6	6.2	5.1	6.8	11.5	15.5	12.0	16
5.3	7.0	5.8	7.6	13.3	17.5	13.6	18
5.7	7.8	6.3	8.5	14.3	19.5	14.8	20
6.3	8.5	7.0	9.4	15.8	21	16.4	22
6.8	9.0	7.6	10.2	17.0	23	18.0	24
7.4	9.8	8.3	11.0	18.5	25	19.6	26
8.3	10.8	9.3	12.1	21.0	27	22.2	28.3

When mounting a bearing on a tapered sleeve, hydraulic fluid can be supplied through the channels located in the sleeve itself.

When mounting a bearing into the housing with a tight fit, it is recommended, before mounting, either to pre-cool the bearing (with liquid nitrogen or dry ice) or to preheat the housing.

When mounting bearings, especially those that are subjected to axial loads, it is advisable whenever possible to make sure, with the use of a feeler gauge or a light slit, that the bearing ring end-faces abut properly and tightly (without misalignment) to the shoulder ends. A similar check should be made on the opposite bearing ends and the ends of the parts pressing them in the axial direction.

It is necessary to check the correctness of the mutual location of bearings in the supports of one shaft. When the supports of one shaft are installed in different split housings, they should be checked, after installation of the housing, for correctness of their mutual position, i.e.; they must be accurately in line with each other. After mounting, the shaft must be easily started by hand and rotate freely and evenly.

9.6 Running Tests

After the bearing has been mounted and checked for ease of rotation, the unit is filled with a prescribed type of lubricant and subjected to running tests aimed at checking the noise level created by the running bearing and the working temperature.

The running test should be performed under partial loading at low and medium rotational speeds. NEVER can bearings, especially thrust-type and angular contact thrust bearings, be tested under no-load conditions, nor be accelerated immediately to high speeds, because in this case balls and rollers will slip over raceway and damage it, or excessive stresses may arise in the bearing cage. Noise created by the bearing rotation should be checked with the use of a stethoscope, tube or hollow rod. Properly mounted and well lubricated bearings produce a soft, slightly buzzing noise in their operation.

The occurrence of a shrill noise may be the evidence of improper mounting, misalignment, damage from the use of hammer; non-uniform noise or knocking reveals the presence of foreign particles in the bearing; a metallic sound is indicative of an insufficient clearance in the bearing; a whistling or gritting sound points to insufficient lubrication.

A rise of bearing temperature immediately after

starting is a normal event, with time temperature gets stabilized. Abnormally high temperatures or persistent temperature variations point to an excessive amount of lubricant in the unit, an unduly tight fit of the bearing in the radial or axial direction, an improper workmanship of the mating parts which causes catching of the bearing cage or rolling elements, stronger friction of seals, or mutual tilt of the rings. Make sure to check the quality of seals and operation of the lubricating equipment during the running tests. The running test process can be considered completed only after stabilization of the bearing temperature conditions.

9.7 Dismounting

Bearing dismounting should be made without damage of bearings and mating parts. If bearings are to be used again after the machine has been disassembled, the dismounting effort shall not be transmitted through rolling elements. With separable bearings, one ring, together with the rolling elements and the bearing cage, can be removed independently of the other ring. Dismantling of non-separable bearings should begin with the removal of a more loosely fitted ring.

9.8 Bearings with Cylindrical Bore

Small-size bearings can be removed from the shaft by lightly knocking with a hammer on the aligning bar made from light metals, shifting the bar over the bearing ring circumference. Larger-size bearings are normally dismantled with the use of various extractor: mechanical screw-type and hydraulically-driven

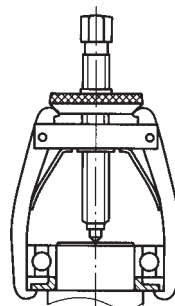


Figure 9.12

removers (see Figure 9.12). The remover rods are pressed directly to the face of the ring to be removed or to the adjacent part. Use may be made of removers carrying stripping rings or half-rings, as well as of three-rod screw removers.

To facilitate future dismantling, designers should make provision for slots in the shaft or housing shoulders permitting insertion of the extraction tools, or for insertion of withdrawal rings/shoulders.

The outer ring will be more readily removed from housings if the latter have threaded holes for driving in thrust screws.

The force applied to remove a bearing is generally much greater than that necessary for pressure-fitting, as the ring sets down with time or fretting can occur, i.e., corrosion (rust from friction) and microseizure of the ring and shaft metal.

Large-size bearings mounted with a tight fit usually require great effort for removal. The use of an oil-pressure fitting method (Supply of oil under pressure to the mounting surface) will substantially facilitate the dismantling procedure. Of course, oil channels and distribution grooves necessary for this purpose should be provided for at the stage of the bearing assembly design.

9.9 Bearings with Tapered Bore

Dismantling of bearings located on an adapter sleeve starts with loosening the lock nut and screwing it out a few turns. Then a special intermediate part—a knock-out bar and a hammer are used to loosen the fit between the sleeve and the bearing (see Figure 9.13). When a press is used, the adapter sleeve or

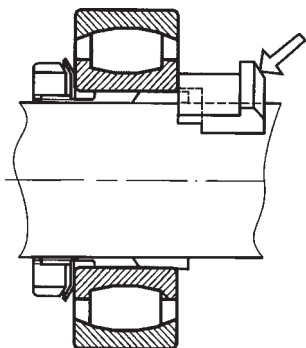


Figure 9.13

the loosened nut should be supported and the bearing should be pressed off from the adapter sleeve.

Dismounting of withdrawal sleeve of mounted bearings begins with the removal of the axial locking elements (the shaft nut, thrust washer, end cover, and

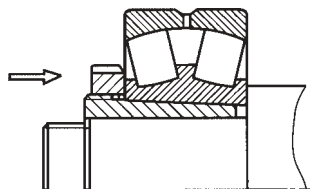


Figure 9.14

the like), then a withdrawal nut is screwed onto the sleeve thread until the sleeve fits in the bearing ring gets loose (see Figure 9.14). If the threaded portion of the sleeve goes beyond the shaft journal, a supporting ring should be inserted into the sleeve bore to protect the thread from damage when the nut is being screwed on. In difficult cases, especially when dismantling large-size bearings, use can be made of extraction

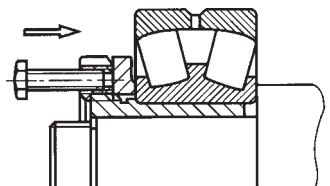


Figure 9.15

nuts with additional thrust bolts (see Figure 9.15).

A washer is inserted between the inner ring and the thrust bolts.

If a bearing is abutted on the lock ring, the simplest way of dismantling withdrawal sleeves is to remove them with the aid of a circular piston pump (see Figure 9.16).

The most simple and reliable technique of dismantling bearings fitted on a tapered shaft journal or those installed with the aid of a tapered sleeve, is to remove them using hydraulically-driven nuts or by means of an oil-pressure filling method, i.e., by supplying oil to the contact zone of the inner ring and the shaft (see Figure 9.17, 9.18). When oil is fed under high pressure, the tight fit rapidly gets looser and the bearing is readily removed from the shaft journal.

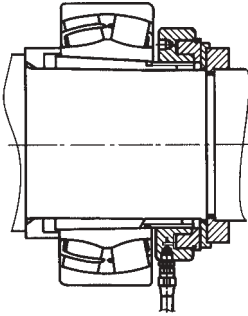


Figure 9.16

The hydraulic method is acceptable for both cylindrical and tapered fits. In both cases the shaft must be provided with oil grooves, supply channels and connecting threads. Large-size adapter and withdrawal sleeves must possess corresponding grooves and holes.

it should be borne in mind that when oil is forced in between tapered mounting surfaces, the pressure joint is immediately released. To prevent accidents while dismounting, it is necessary to limit the axial motion (shift) of the bearing or withdrawal sleeve with the aid of the lock nut, fastening sleeve nut or with a stop.

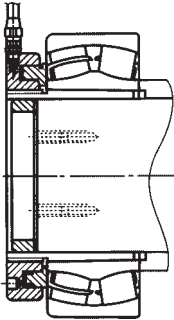


Figure 9.17

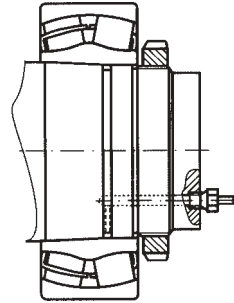
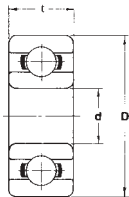


Figure 9.18

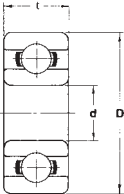
MR Series* Open



Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
MR31	L-310W51	1.0	3.0	1.5	74	20	130	150	0.05
MR41X	R-412	1.2	4.0	1.8	108	34	110	130	0.10
MR52	L-520W02	2.0	5.0	2.0	167	49	85	100	0.14
MR62	R-620W52	2.0	6.0	2.5	334	98	75	90	0.28
MR72	R-720Y52	2.0	7.0	2.5	383	128	63	75	0.43
MR82X	R-825Y52	2.5	8.0	2.5	559	177	60	67	0.52
MR63	L-630	3.0	6.0	2.0	206	74	71	80	0.20
MR83	R-830Y52	3.0	8.0	2.5	392	137	60	67	0.51
MR93	R-930Y52	3.0	9.0	2.5	569	186	56	67	0.75
MR74	L-740	4.0	7.0	2.0	314	118	60	67	0.23
MR84	L-840	4.0	8.0	2.0	392	137	56	67	0.39
MR104	L-1040	4.0	10.0	3.0	589	206	48	56	0.95
MR85	L-850	5.0	8.0	2.0	304	118	53	63	0.25
MR95	L-950	5.0	9.0	2.5	432	167	50	60	0.54
MR105	L-1050	5.0	10.0	3.0	432	167	50	60	0.91
MR106	L-1060	6.0	10.0	2.5	500	216	45	53	0.55
MR126	L-1260	6.0	12.0	3.0	716	294	43	50	1.25
MR117	L-1170	7.0	11.0	2.5	451	206	43	50	0.59
MR137	L-1370	7.0	13.0	3.0	540	275	40	48	1.52
MR128	L-1280	8.0	12.0	2.5	540	275	40	48	0.70
MR148	L-1480	8.0	14.0	3.5	814	383	38	45	1.90

* All Bearings are available with stainless steel 440C

600 Series*
Open



Miniature Ball Bearings

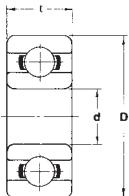
Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
601X	R-615	1.5	6	2.5	334	98	75	90	0.31
602	R-725	2.0	7	2.8	383	128	60	71	0.50
602X	R-825	2.5	8	2.8	549	177	60	71	0.61
603	R-930	3.0	9	3.0	569	186	56	67	0.84
604	R-1240	4.0	12	4.0	961	353	48	56	2.19
605	R-1450	5.0	14	5.0	1334	510	40	50	3.46
606	R-1760	6.0	17	6.0	2266	844	38	45	5.94
607	R-1970	7.0	19	6.0	2335	893	36	43	7.80
608	R-2280	8.0	22	7.0	3296	1383	34	40	11.80
609	—	9.0	24	7.0	3335	1422	32	38	14.70

* All Bearings are available with stainless steel 440C

620 Series*
Open

Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
623	R-1030	3	10	4	627.8	215.8	50	60	1.45
624	R-1340	4	13	5	1305	490.5	40	48	3.10
625	R-1650	5	16	5	1727	676.9	36	43	4.95
626	R-1960	6	19	6	2335	892.7	32	40	8.12
627	R-2270	7	22	7	3286	1383	30	36	12.70
628	—	8	24	8	3335	1422	28	34	17.10
629	R-2690	9	26	8	4571	1982	28	34	19.00

* All Bearings are available with stainless steel 440C



630 Series* Open

Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
633	—	3	13	5	1305	490.5	40	48	3.27
634	R-1640	4	16	5	1344	519.9	36	43	5.24
635	—	5	19	6	2335	892.7	32	40	8.50
636	—	6	22	7	3335	1422	30	36	13.90
637	—	7	26	9	4571	1982	28	34	24.20
638	—	8	28	9	4571	1982	28	34	28.10
639	—	9	30	10	4660	2080	24	30	36.20

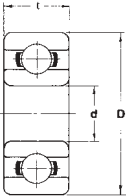
* All Bearings are available with stainless steel 440C

680 Series* Open

Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
681	L-310	1.0	3	1.0	74	20	130	150	0.03
681X	L-415	1.5	4	1.2	108	34	100	120	0.10
682	L-520	2.0	5	1.5	167	49	85	100	0.15
682X	L-625	2.5	6	1.8	186	59	71	80	0.20
683	L-730	3.0	7	2.0	314	108	63	75	0.32
684	L-940	4.0	9	2.5	638	226	53	63	0.65
685	L-1150	5.0	11	3.0	716	294	45	53	1.16
686	L-1360	6.0	13	3.5	1079	441	40	50	1.87
687	L-1470	7.0	14	3.5	1177	510	40	50	2.03
688	L-1680	8.0	16	4.0	1256	589	36	43	3.11
689	L-1790	9.0	17	4.0	1324	667	36	43	3.41

* All Bearings are available with stainless steel 440C

690 Series*
Open

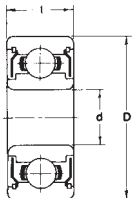


Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
691	R-410	1.0	4	1.6	137	39.2	100	120	0.11
691X	R-515	1.5	5	2.0	167	49.1	85	100	0.20
692	R-620	2.0	6	2.3	334	98.1	75	90	0.28
692X	R-725	2.5	7	2.5	383	128	63	75	0.40
693	R-830	3.0	8	3.0	559	177	60	67	0.60
694	R-1140	4.0	11	4.0	961	353	48	56	1.69
695	R-1350	5.0	13	4.0	1079	432	43	50	2.39
696	R-1560	6.0	15	5.0	1344	520	40	45	3.85
697	—	7.0	17	5.0	1609	716	36	43	5.26
698	—	8.0	19	6.0	2237	922	36	43	7.12
699	L-2090	9.0	20	6.0	2472	1079	34	40	3.38

* All Bearings are available with stainless steel 440C

MR Series*

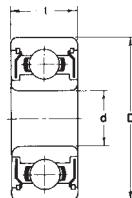
Double Shielded



Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
MR41XZZ	—	1.2	4	2.5	108	34	110	130	0.14
MR52ZZ	L-520ZZW52	2.0	5	2.5	167	49	85	100	0.20
MR62ZZ	R-620ZZY52	2.0	6	2.5	334	98	75	90	0.33
MR72ZZ	R-720ZZY03	2.0	7	3.0	383	128	63	75	0.53
MR63ZZ	L-630ZZ	3.0	6	2.5	206	74	71	80	0.28
MR83ZZ	—	3.0	8	3.0	392	137	60	67	0.67
MR93ZZ	R-930ZZY04	3.0	9	4.0	569	186	56	67	1.15
MR74ZZ	L-740ZZ	4.0	7	2.5	255	108	60	67	0.33
MR84ZZ	L-840ZZ	4.0	8	3.0	392	137	56	67	0.56
MR104ZZ	L-1040ZZ	4.0	10	4.0	589	206	48	56	1.33
MR85ZZ	L-850ZZ	5.0	8	2.5	216	88	53	63	0.34
MR95ZZ	L-950ZZ	5.0	9	3.0	432	167	50	60	0.58
MR105ZZ	L-1050ZZ	5.0	10	4.0	432	167	50	60	1.26
MR115ZZ	—	5.0	11	4.0	716	294	45	53	0.62
MR106ZZ	L-1060ZZ	6.0	10	3.0	500	216	45	53	0.70
MR126ZZ	L-1260ZZ	6.0	12	4.0	716	294	43	50	1.66
MR117ZZ	L-1170ZZ	7.0	11	3.0	451	206	43	50	0.71
MR137ZZ	L-1370ZZ	7.0	13	4.0	540	275	40	48	2.01
MR128ZZ	L-1280ZZ	8.0	12	3.5	540	275	40	48	0.99
MR148ZZ	L-1480ZZ	8.0	14	4.0	814	383	38	45	2.19

* All Bearings are available with stainless steel 440C

600 Series* Double Shielded



Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
601XZZ	R-615ZZ	1.5	6	3.0	334	98	75	90	0.40
602ZZ	R-720ZZ	2.0	7	3.5	383	128	60	71	0.60
620XZZ	R-825ZZ	2.5	8	4.0	549	177	60	71	0.85
603ZZ	R-930ZZ	3.0	9	5.0	569	186	56	67	1.43
604ZZ	R-1240ZZ	4.0	12	4.0	961	353	48	56	2.34
605ZZ	R-1450ZZ	5.0	14	5.0	1334	510	40	50	3.75
606ZZ	R-1760ZZ	6.0	17	6.0	2266	844	38	45	6.89
607ZZ	R-1970ZZ	7.0	19	6.0	2335	893	36	43	8.24
608ZZ	R-2280ZZ	8.0	22	7.0	3296	1383	34	40	12.90
609ZZ	—	9.0	24	7.0	3335	1422	32	38	16.00

* All Bearings are available with stainless steel 440C

Please indicate '-2RS' behind the basic number, instead of 'ZZ' if you are looking for both side rubber seal bearing.

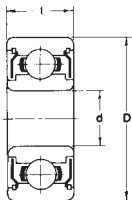
620 Series* Double Shielded

Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
623ZZ	R-1030ZZ	3	10	4	628	216	50	60	1.65
624ZZ	R-1340ZZ	4	13	5	1305	491	40	48	3.20
625ZZ	R-1650ZZ	5	16	5	1727	677	36	43	5.10
626ZZ	R-1960ZZ	6	19	6	2335	893	32	40	8.65
627ZZ	R-2270ZZ	7	22	7	3286	1383	30	36	13.10
628ZZ	—	8	24	8	3335	1422	28	34	18.50
629ZZ	R-2690ZZ	9	26	8	4571	1982	28	34	21.80

* All Bearings are available with stainless steel 440C

Please indicate '-2RS' behind the basic number, instead of 'ZZ' if you are looking for both side rubber seal bearing.

630 Series* Double Shielded



Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
633ZZ	—	3	13	5	1305	491	40	48	3.43
634ZZ	R-1640ZZ	4	16	5	1344	520	36	43	5.44
635ZZ	—	5	19	6	2335	893	32	40	8.89
636ZZ	—	6	22	7	3335	1422	30	36	14.50
637ZZ	—	7	26	9	4571	1982	28	34	25.80
638ZZ	—	8	28	9	4571	1982	28	34	30.30
639ZZ	—	9	30	10	4660	2080	24	30	37.10

Please indicate '2RS' behind the basic number, instead of 'ZZ' if you are looking for both side rubber seal bearing.

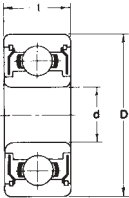
680 Series* Double Shielded

Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
681XZZ	L-415ZZ	1.5	4	2.0	108	34	100	120	0.14
682ZZ	L-520ZZ	2.0	5	2.3	167	49	85	100	0.20
682XZZ	L-625ZZ	2.5	6	2.6	186	59	71	80	0.35
683ZZ	L-730ZZ	3.0	7	3.0	314	108	63	75	0.45
684ZZ	L-940ZZ	4.0	9	4.0	638	226	53	63	1.00
685ZZ	L-1150ZZ	5.0	11	5.0	716	294	45	53	1.93
686ZZ	L-1360ZZ	6.0	13	5.0	1079	441	40	50	2.68
687ZZ	L-1470ZZ	7.0	14	5.0	1177	510	40	50	2.95
688ZZ	L-1680ZZ	8.0	16	5.0	1256	589	36	43	4.05
689ZZ	L-1790ZZ	9.0	17	5.0	1324	667	36	43	4.38

* All Bearings are available with stainless steel 440C

Please indicate '2RS' behind the basic number, instead of 'ZZ' if you are looking for both side rubber seal bearing.

690 Series*
Double Shielded

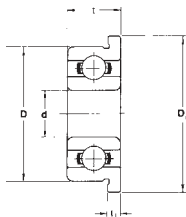


Bearing Number	Equivalent Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	C _r	C _{or}	Grease	Oil	
691XZZ	R-515ZZ	1.5	5	2.6	167	49	85	100	0.25
692ZZ	R-620ZZ	2.0	6	3.0	334	98	75	90	0.35
692XZZ	R-725ZZ	2.5	7	3.5	383	128	63	75	0.55
693ZZ	R-830ZZ	3.0	8	4.0	559	177	60	67	0.80
694ZZ	R-1140ZZ	4.0	11	4.0	961	353	48	56	1.75
695ZZ	R-1350ZZ	5.0	13	4.0	1079	432	43	50	2.31
696ZZ	R-1560ZZ	6.0	15	5.0	1344	520	40	45	3.65
697ZZ	—	7.0	17	5.0	1609	716	36	43	5.01
698ZZ	—	8.0	19	6.0	2237	922	36	43	7.57
699ZZ	L-2090ZZ	9.0	20	6.0	2472	1079	34	40	8.54

* All Bearings are available with stainless steel 440C
Please indicate '-2RS' behind the basic number, instead of 'ZZ' if you are looking for both side rubber seal bearing.

MF Series*

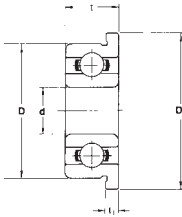
Flanged, Open



Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
MF41X	—	1.2	4	1.8	4.8	0.4	108	34	110	130	0.12
MF52	LF-520W02	2.0	5	2.0	6.2	0.6	167	49	85	100	0.19
MF62	RF-620W52	2.0	6	2.5	7.2	0.6	334	98	75	90	0.34
MF72	RF-720Y52	2.0	7	2.5	8.2	0.6	383	128	63	75	0.50
MF82X	RF-825Y52	2.5	8	2.5	9.2	0.6	559	177	60	67	0.60
MF63	LF-630	3.0	6	2.0	7.2	0.6	206	74	71	80	0.26
MF83	RF-830Y52	3.0	8	2.5	9.2	0.6	392	137	60	67	0.59
MF93	RF-930Y52	3.0	9	2.5	10.6	0.6	569	186	56	67	0.83
MF74	LF-740	4.0	7	2.0	8.2	0.6	314	118	60	67	0.30
MF84	LF-840	4.0	8	2.0	9.2	0.6	392	137	56	67	0.47
MF104	LF-1040	4.0	10	3.0	11.2	0.6	589	206	48	56	1.04
MF85	LF-850	5.0	8	2.0	9.2	0.6	304	118	53	63	0.33
MF95	LF-950	5.0	9	2.5	10.2	0.6	432	167	50	60	0.62
MF105	LF-1050	5.0	10	3.0	11.6	0.6	431	167	50	60	1.00
MF106	LF-1060	6.0	10	2.5	11.2	0.6	500	216	45	53	0.64
MF126	LF-1260	6.0	12	3.0	13.6	0.6	716	294	43	50	1.44
MF117	LF-1170	7.0	11	2.5	12.2	0.6	451	206	43	50	0.69
MF137	LF-1370	7.0	13	3.0	14.2	0.6	540	275	40	48	1.64
MF128	LF-1280	8.0	12	2.5	13.6	0.6	540	275	40	48	0.81
MF148	LF-1480	8.0	14	3.5	15.6	0.8	814	383	38	45	2.13

* All Bearings are available with stainless steel 440C

600 Series*
Flanged, Open



Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D _i	Flange Width t _i	C _r	C _{or}	Grease	Oil	
F601X	RF-615	1.5	6	2.5	7.5	0.6	334	98	75	90	0.38
F602	RF-720	2.0	7	2.8	8.5	0.7	383	128	60	71	0.60
F602X	RF-825	2.5	8	2.8	9.5	0.7	549	177	60	71	0.72
F603	RF-930	3.0	9	3.0	10.5	0.7	569	186	56	67	0.96
F604	RF-1240	4.0	12	4.0	13.5	1.0	961	353	48	56	2.42
F605	RF-1450	5.0	14	5.0	16.0	1.0	1334	510	40	50	3.83
F606	RF-1760	6.0	17	6.0	19.0	1.2	2266	844	38	45	6.47
F607	RF-1970	7.0	19	6.0	22.0	1.5	2335	893	36	43	8.93
F608	RF-2280	8.0	22	7.0	25.0	1.5	3296	1383	34	40	13.10
F609	—	9.0	24	7.0	27.0	1.5	3335	1422	32	38	16.10

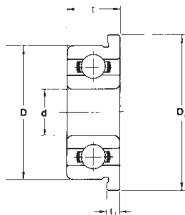
* All Bearings are available with stainless steel 440C

620 Series*
Flanged, Open

Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D _i	Flange Width t _i	C _r	C _{or}	Grease	Oil	
F623	RF-1030	3	10	4	11.5	1.0	628	216	50	60	1.65
F624	RF-1340	4	13	5	15.0	1.0	1305	491	40	48	3.44
F625	RF-1650	5	16	5	18.0	1.0	1727	677	36	43	5.37
F626	RF-1960	6	19	6	22.0	1.5	2335	893	32	40	9.25
F627	RF-2270	7	22	7	25.0	1.5	3286	1383	30	36	14.00

* All Bearings are available with stainless steel 440C

630 Series* Flanged, Open



Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
F634	RF-1640	4	16	5	18	1.0	1344	520	36	43	5.66
F635	—	5	19	6	22	1.5	2335	893	32	40	9.26

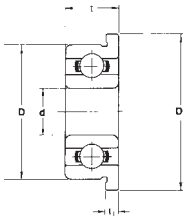
* All Bearings are available with stainless steel 440C

680 Series* Flanged, Open

Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
F681	LF-310	1.0	3	1.0	3.8	0.3	74	20	130	150	0.04
F681X	LF-415	1.5	4	1.2	5.0	0.4	108	34	100	120	0.12
F682	LF-520	2.0	5	1.5	6.1	0.5	167	49	85	100	0.19
F682X	LF-625	2.5	6	1.8	7.1	0.5	186	59	71	80	0.24
F683	LF-730	3.0	7	2.0	8.1	0.5	314	108	63	75	0.37
F684	LF-940	4.0	9	2.5	10.3	0.6	638	226	53	63	0.74
F685	LF-1150	5.0	11	3.0	12.5	0.8	716	284	45	53	1.33
F686	LF-1360	6.0	13	3.5	15.0	1.0	1079	441	40	50	2.21
F687	LF-1470	7.0	14	3.5	16.0	1.0	1177	510	40	50	2.40
F688	LF-1680	8.0	16	4.0	18.0	1.0	1256	589	36	43	3.53
F689	LF-1790	9.0	17	4.0	19.0	1.0	1324	667	36	43	3.85

* All Bearings are available with stainless steel 440C

690 Series*
Flanged, Open



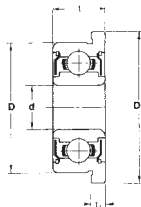
Miniature Ball Bearings

Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
F691	RF-410	1.0	4	1.6	5.0	0.5	137	39	100	120	0.14
F691X	RF-515	1.5	5	2.0	6.5	0.6	167	49	85	100	0.26
F692	RF-620	2.0	6	2.3	7.5	0.6	334	98	75	90	0.35
F692X	RF-725	2.5	7	2.5	8.5	0.7	383	128	63	75	0.50
F693	RF-830	3.0	8	3.0	9.5	0.7	559	177	60	67	0.71
F694	RF-1140	4.0	11	4.0	12.5	1.0	961	353	48	56	1.91
F695	RF-1350	5.0	13	4.0	15.0	1.0	1079	432	43	50	2.73
F696	RF-1560	6.0	15	5.0	17.0	1.2	1344	520	40	45	4.24
F697	—	7.0	17	5.0	19.0	1.2	1609	716	36	43	5.79
F698	—	8.0	19	6.0	22.0	1.5	2237	922	36	43	8.25
F699	LF-2090	9.0	20	6.0	23.0	1.5	2472	1079	34	40	9.57

* All Bearings are available with stainless steel 440C

MF Series*

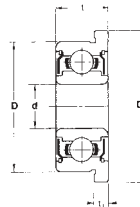
Flanged, Double Shielded



Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
MF52ZZ	LF-520ZZW52	2	5	2.5	6.2	0.6	167	49	85	100	0.25
MF72ZZ	RF-720ZZY03	2	7	3.0	8.2	0.6	383	128	63	75	0.60
MF63ZZ	LF-630ZZ	3	6	2.5	7.2	0.6	206	74	71	80	0.34
MF93ZZ	RFR-930ZZY04	3	9	4.0	10.6	0.8	569	186	56	67	1.30
MF74ZZ	LF-740ZZ	4	7	2.5	8.2	0.6	255	108	60	67	0.40
MF84ZZ	LF-840ZZ	4	8	3.0	9.2	0.6	392	137	56	67	0.64
MF104ZZ	LF-1040ZZ	4	10	4.0	11.6	0.8	589	206	48	56	1.50
MF85ZZ	LF-850ZZ	5	8	2.5	9.2	0.6	216	88	53	63	0.42
MF95ZZ	LF-950ZZ	5	9	3.0	10.2	0.6	432	167	50	60	0.66
MF105ZZ	LF-1050ZZ	5	10	4.0	11.6	0.8	432	167	50	60	1.38
MF115ZZ	—	5	11	4.0	12.6	0.8	716	284	45	53	0.81
MF106ZZ	LF-1060ZZ	6	10	3.0	11.2	0.6	500	216	45	53	0.79
MF126ZZ	LF-1260ZZ	6	12	4.0	13.6	0.8	716	294	43	50	1.86
MF117ZZ	LF-1170ZZ	7	11	3.0	12.2	0.6	451	206	43	50	0.81
MF137ZZ	LF-1370ZZ	7	13	4.0	14.6	0.8	540	275	40	48	2.17
MF128ZZ	LF-1280ZZ	8	12	3.5	13.6	0.8	540	275	40	48	1.14
MF148ZZ	LF-1480ZZ	8	14	4.0	15.6	0.8	814	383	38	45	2.42

* All Bearings are available with stainless steel 440C

600 Series* Flanged, Double Shielded



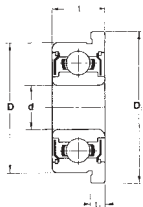
Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
F601XZZ	RF-615ZZ	1.5	6	3.0	7.5	0.8	334	98	75	90	0.50
F602ZZ	RF-720ZZ	2.0	7	3.5	8.5	0.9	383	128	60	71	0.73
F602XZZ	RF-825ZZ	2.5	8	4.0	9.5	0.9	549	177	60	71	0.99
F603ZZ	RF-930ZZ	3.0	9	5.0	10.5	1.0	569	186	56	67	1.61
F604ZZ	RF-1240ZZ	4.0	12	4.0	13.5	1.0	961	353	48	56	2.57
F605ZZ	RF-1450ZZ	5.0	14	5.0	16.0	1.0	1334	510	40	50	4.12
F606ZZ	RF-1760ZZ	6.0	17	6.0	19.0	1.2	2266	844	38	45	7.42
F607ZZ	RF-1970ZZ	7.0	19	6.0	22.0	1.5	2335	893	36	43	9.37
F608ZZ	RF-2280ZZ	8.0	22	7.0	25.0	1.5	3296	1383	34	40	14.20
F609ZZ	—	9.0	24	7.0	27.0	1.5	3335	1422	32	38	17.40

* All Bearings are available with stainless steel 440C

620 Series* Flanged, Double Shielded

Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
F623ZZ	RF-1030ZZ	3	10	4	11.5	1.0	628	216	50	60	1.85
F624ZZ	RF-1340ZZ	4	13	5	15.0	1.0	1305	491	40	48	3.54
F625ZZ	RF-1650ZZ	5	16	5	18.0	1.0	1727	677	36	43	5.52
F626ZZ	RF-1960ZZ	6	19	6	22.0	1.5	2335	893	32	40	9.78
F627ZZ	RF-2270ZZ	7	22	7	25.0	1.5	3286	1383	30	36	14.40

* All Bearings are available with stainless steel 440C



630 Series* Flanged, Double Shielded

Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
F634ZZ	RF-1640ZZ	4	16	5	18	1.0	1344	520	36	43	5.86
F635ZZ	—	5	19	6	22	1.5	2335	893	32	40	9.65

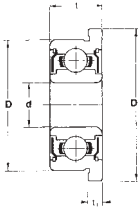
* All Bearings are available with stainless steel 440C

680 Series* Flanged, Double Shielded

Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
F681XZZ	LF-415ZZ	1.5	4	2.0	5.0	0.6	108	34	100	120	0.17
F682ZZ	LF-520ZZ	2.0	5	2.3	6.1	0.6	167	49	85	100	0.24
F682XZZ	LF-625ZZ	2.5	6	2.6	7.1	0.8	186	59	71	80	0.42
F683ZZ	LF-730ZZ	3.0	7	3.0	8.1	0.8	314	108	63	75	0.53
F684ZZ	LF-940ZZ	4.0	9	4.0	10.3	1.0	638	226	53	63	1.15
F685ZZ	LF-1150ZZ	5.0	11	5.0	12.5	1.0	716	284	45	53	2.15
F686ZZ	LF-1360ZZ	6.0	13	5.0	15.0	1.1	1079	441	40	50	3.06
F687ZZ	LF-1470ZZ	7.0	14	5.0	16.0	1.1	1177	510	40	50	3.35
F688ZZ	LF-1680ZZ	8.0	16	5.0	18.0	1.1	1256	589	36	43	4.51
F689ZZ	—	9.0	17	5.0	19.0	1.1	1324	667	36	43	4.87

* All Bearings are available with stainless steel 440C

690 Series*
Flanged, Double Shielded

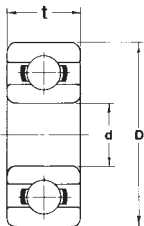


Miniature Ball Bearings

Bearing Number	Equivalent Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d	OD D	Width t	Flange Dia. D ₁	Flange Width t ₁	C _r	C _{or}	Grease	Oil	
F691XZZ	RF-515ZZ	1.5	5	2.6	6.5	0.8	167	49	85	100	0.33
F692ZZ	RF-620ZZ	2.0	6	3.0	7.5	0.8	334	98	75	90	0.45
F692XZZ	RF-725ZZ	2.5	7	3.5	8.5	0.9	383	128	63	75	0.68
F693ZZ	RF-830ZZ	3.0	8	4.0	9.5	0.9	559	177	60	67	0.94
F694ZZ	RF-1140ZZ	4.0	11	4.0	12.5	1.0	961	353	48	56	1.97
F695ZZ	RF-1350ZZ	5.0	13	4.0	15.0	1.0	1079	432	43	50	2.65
F696ZZ	RF-1560ZZ	6.0	15	5.0	17.0	1.2	1344	520	40	45	4.04
F697ZZ	—	7.0	17	5.0	19.0	1.2	1609	716	36	43	5.54
F698ZZ	—	8.0	19	6.0	22.0	1.5	2237	922	36	43	8.70
F699ZZ	LF-2090ZZ	9.0	20	5.0	23.0	1.5	2472	1079	34	40	9.73

* All Bearings are available with stainless steel 440C

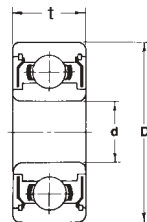
Inch Series* Open



Bearing Number	Equivalent Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d		OD D		Width t		C _r	C _{or}	Grease	Oil	
		inch	mm	inch	mm	inch	mm					
R0	RI-2 ¹ / ₂	³ / ₆₄	1.191	⁵ / ₃₂	3.967	¹ / ₁₆	1.588	108	34	110	130	0.10
R1	RI-3	⁷ / ₁₂₈	1.397	³ / ₁₆	4.762	⁵ / ₆₄	1.984	235	69	90	110	0.15
R1-4	RI-4	⁵ / ₆₄	1.984	¹ / ₄	6.350	³ / ₃₂	2.380	284	98	67	80	0.40
R133	RI-3332	³ / ₃₂	2.380	³ / ₁₆	4.762	¹ / ₁₆	1.588	186	59	80	95	0.10
R1-5	RI-5	³ / ₃₂	2.380	⁵ / ₁₆	7.938	⁷ / ₆₄	2.779	549	177	60	71	0.60
R144	RI-418	¹ / ₈	3.175	¹ / ₄	6.350	³ / ₃₂	2.380	314	108	67	80	0.27
R2-5	RI-518	¹ / ₈	3.175	⁵ / ₁₆	7.938	⁷ / ₆₄	2.779	559	177	60	67	0.50
R2-6	RI-618	¹ / ₈	3.175	³ / ₈	9.525	⁷ / ₆₄	2.779	638	226	53	63	0.96
R2	R2	¹ / ₈	3.175	³ / ₈	9.525	⁵ / ₃₂	3.967	628	216	56	67	1.04
R2A	—	¹ / ₈	3.175	¹ / ₂	12.700	¹¹ / ₆₄	4.366	638	226	53	63	3.30
R155	R1-5532	⁵ / ₃₂	3.967	⁵ / ₁₆	7.938	⁷ / ₆₄	2.779	363	147	53	63	0.51
R156	RI-5632	³ / ₁₆	4.762	⁵ / ₁₆	7.938	⁷ / ₆₄	2.779	363	147	53	63	0.40
R166	RI-6632	³ / ₁₆	4.762	³ / ₈	9.525	¹ / ₈	3.175	706	275	50	60	0.81
R3	R-3	³ / ₁₆	4.762	¹ / ₂	12.700	⁵ / ₃₂	3.967	1305	491	43	53	2.21
R3A	—	³ / ₁₆	4.762	⁵ / ₈	15.875	²⁵ / ₁₂₈	4.978	1481	618	38	45	4.75
R168	RI-614	¹ / ₄	6.350	³ / ₈	9.525	¹ / ₈	3.175	373	177	48	56	0.57
R188	RI-814	¹ / ₄	6.350	¹ / ₂	12.700	¹ / ₈	3.175	1079	441	40	50	1.60
R4	R-4	¹ / ₄	6.350	⁵ / ₈	15.875	²⁵ / ₁₂₈	4.978	1481	618	38	45	4.46
R4A	RI-1214	¹ / ₄	6.350	³ / ₄	19.050	⁷ / ₃₂	5.558	2335	893	36	43	7.48
R1810	RI-8516	⁵ / ₁₆	7.938	¹ / ₂	12.700	⁵ / ₃₂	3.967	540	275	40	48	1.39
R6	RI-1438	³ / ₈	9.525	⁷ / ₈	22.225	⁷ / ₃₂	5.558	3335	1422	32	38	9.02
R8	RI-1812	¹ / ₂	12.700	¹ / ₈	28.575	¹ / ₄	6.350	5111	2413	27	32	11.60
R10	—	⁵ / ₈	15.875	¹ / ₈	34.925	⁹ / ₃₂	7.142	5994	3286	21	25	23.50
R12	—	³ / ₄	19.050	¹ / ₈	41.275	⁵ / ₁₆	7.938	7907	4483	17	21	53.10
R14	—	⁷ / ₈	22.225	¹ / ₈	47.625	³ / ₈	9.525	9000	5400	14	19	71.00
R16	—	1	25.400	2	50.800	³ / ₈	9.525	10200	6200	12	17	85.00
R18	—	¹ / ₈	28.575	² / ₈	53.975	³ / ₈	9.525	11800	7200	11	16	90.00
R20	—	¹ / ₄	31.750	² / ₄	57.150	³ / ₈	9.525	12900	8500	10	15	95.00
R22	—	¹ / ₈	34.925	² / ₂	63.500	⁷ / ₁₆	11.112	14000	9800	9	13	120.00
R24	—	¹ / ₂	38.100	² / ₈	66.675	⁷ / ₁₆	11.112	16000	11000	8	12	150.00

* All Bearings are available with stainless steel 440C

Inch Series* Double Shielded

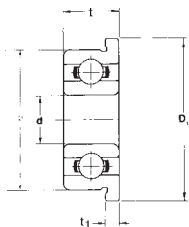


Bearing Number	Equivalent Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
		Bore d		OD D		Width t		C _r	C _{or}	Grease	Oil	
		inch	mm	inch	mm	inch	mm					
R0ZZ	RI-2 ¹ / ₂ ZZ	³ / ₆₄	1.191	⁵ / ₃₂	3.967	³ / ₃₂	2.380	108	34	110	130	0.15
R1ZZ	RI-3ZZ	⁷ / ₁₂₈	1.397	³ / ₁₆	4.762	⁷ / ₆₄	2.779	235	69	90	110	0.19
R1-4ZZ	RI-4ZZ	⁵ / ₆₄	1.984	¹ / ₄	6.350	⁹ / ₆₄	3.571	284	98	67	80	0.53
R133ZZ	RI-3332ZZ	³ / ₃₂	2.380	³ / ₁₆	4.762	³ / ₃₂	2.380	147	54	80	95	0.15
R1-5ZZ	RI-5ZZ	³ / ₃₂	2.380	⁵ / ₁₆	7.938	⁹ / ₆₄	3.571	549	177	60	71	1.15
R144ZZ	RI-418ZZ	¹ / ₈	3.175	¹ / ₄	6.350	⁷ / ₆₄	2.779	314	108	67	80	0.32
R2-5ZZ	RI-518ZZ	¹ / ₈	3.175	⁵ / ₁₆	7.938	⁹ / ₆₄	3.571	559	177	60	67	0.74
R2-6ZZ	RI-618ZZ	¹ / ₈	3.175	³ / ₈	9.525	⁹ / ₆₄	3.571	638	226	53	63	1.23
77R2	RI-2ZZ	¹ / ₈	3.175	³ / ₈	9.525	⁵ / ₃₂	3.967	628	216	56	67	1.37
77R2A	—	¹ / ₈	3.175	¹ / ₂	12.700	¹¹ / ₆₄	4.366	638	226	53	63	3.30
R155ZZ	R1-5532ZZ	⁵ / ₃₂	3.967	⁵ / ₁₆	7.938	¹ / ₈	3.175	363	147	53	63	0.61
R156ZZ	RI-5632ZZ	³ / ₁₆	4.762	⁵ / ₁₆	7.938	¹ / ₈	3.175	363	147	53	63	0.45
R166ZZ	RI-6632ZZ	³ / ₁₆	4.762	³ / ₈	9.525	¹ / ₈	3.175	706	275	50	60	0.85
77R3	RI-3ZZ	³ / ₁₆	4.762	¹ / ₂	12.700	²⁵ / ₁₂₈	4.978	1305	491	43	53	2.95
77R3A	—	³ / ₁₆	4.762	⁵ / ₈	15.875	²⁵ / ₁₂₈	4.978	1481	618	38	45	5.08
R168ZZ	RI-614ZZ	¹ / ₄	6.350	³ / ₈	9.525	¹ / ₈	3.175	38	18	48	56	0.60
R188ZZ	RI-814ZZ	¹ / ₄	6.350	¹ / ₂	12.700	³ / ₁₆	4.762	1079	441	40	50	2.32
77R4	RI-4ZZ	¹ / ₄	6.350	⁵ / ₈	15.875	²⁵ / ₁₂₈	4.978	1481	618	38	45	4.54
77R4A	RI-1214ZZ	¹ / ₄	6.350	³ / ₄	19.050	⁹ / ₃₂	7.142	2335	893	36	43	10.00
R1810ZZ	RI-8516ZZ	⁵ / ₁₆	7.938	¹ / ₂	12.700	⁵ / ₃₂	3.967	540	275	40	48	1.57
77R6	RI-1438ZZ	³ / ₈	9.525	⁷ / ₈	22.225	⁹ / ₃₂	7.142	3335	1422	32	38	11.70
77R8	RI-1812ZZ	¹ / ₂	12.700	¹ / ₈	28.575	⁵ / ₁₆	7.938	5111	2413	27	32	24.10
77R10	—	⁵ / ₈	15.875	¹³ / ₈	34.925	¹¹ / ₃₂	8.733	5994	3286	21	25	38.10
77R12	—	³ / ₄	19.050	¹⁵ / ₈	41.275	0.438	11.113	7907	4483	17	21	69.30
77R14	—	⁷ / ₈	22.225	¹⁷ / ₈	47.625	¹ / ₂	12.700	9000	5400	14	19	85.00
77R16	—	1	25.400	2	50.800	¹ / ₂	12.700	10200	6200	12	17	101.00
77R18	—	¹ / ₈	28.575	² / ₈	53.975	¹ / ₂	12.700	11800	7200	11	16	109.00
77R20	—	¹ / ₄	31.750	² / ₄	57.150	¹ / ₂	12.700	12900	8500	10	15	118.00
77R22	—	¹³ / ₈	34.925	² / ₂	63.50	⁹ / ₁₆	14.288	14000	9800	9	13	145.00
77R24	—	¹ / ₂	38.100	²⁵ / ₈	66.675	⁹ / ₁₆	14.288	16000	11000	8	12	178.00

* All Bearings are available with stainless steel 440C

If you are looking for both side rubber seal bearing, Please indicate "99" instead of "77" as the prefix or "2RS" instead of "ZZ" as the suffix

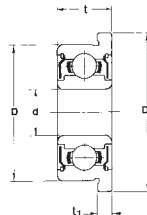
Inch Series* Flanged, Open



Bearing Number	Dimensions (mm)								Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
	Bore d		OD D		Width t		Flange Dia. D _i	Flange Width t _i	C _r	C _{or}	Grease	Oil	
	inch	mm	inch	mm	inch	mm							
FR0	³ / ₆₄	1.191	⁵ / ₃₂	3.967	¹ / ₁₆	1.588	5.156	0.330	108	34	110	130	0.12
FR1	⁷ / ₁₂₈	1.397	³ / ₁₆	4.762	⁵ / ₆₄	1.984	5.944	0.584	235	69	90	110	0.19
FR1-4	⁵ / ₆₄	1.984	¹ / ₄	6.350	³ / ₃₂	2.380	7.518	0.584	284	98	67	80	0.46
FR133	³ / ₃₂	2.380	³ / ₁₆	4.762	¹ / ₁₆	1.588	5.944	0.457	186	59	80	95	0.13
FR1-5	³ / ₃₂	2.380	⁵ / ₁₆	7.938	⁷ / ₆₄	2.779	9.119	0.584	549	177	60	71	0.67
FR144	¹ / ₈	3.175	¹ / ₄	6.350	³ / ₃₂	2.380	7.518	0.584	314	108	67	80	0.33
FR2-5	¹ / ₈	3.175	⁵ / ₁₆	7.938	⁷ / ₆₄	2.779	9.119	0.584	559	177	60	67	0.57
FR2-6	¹ / ₈	3.175	³ / ₈	9.525	⁷ / ₆₄	2.779	10.719	0.584	638	226	53	63	1.05
FR2	¹ / ₈	3.175	³ / ₈	9.525	⁵ / ₃₂	3.967	11.176	0.762	628	216	56	67	1.20
FR155	⁵ / ₃₂	3.967	⁵ / ₁₆	7.938	⁷ / ₆₄	2.779	9.119	0.584	363	147	53	63	0.58
FR156	³ / ₁₆	4.762	⁵ / ₁₆	7.938	⁷ / ₆₄	2.779	9.119	0.584	363	147	53	63	0.47
FR166	³ / ₁₆	4.762	³ / ₈	9.525	¹ / ₈	3.175	10.719	0.584	706	275	50	60	0.90
FR3	³ / ₁₆	4.762	¹ / ₂	12.700	²⁵ / ₁₂₈	4.978	14.351	1.067	1305	491	43	53	2.50
FR168	¹ / ₄	6.350	³ / ₈	9.525	¹ / ₈	3.175	10.719	0.584	373	177	48	56	0.66
FR188	¹ / ₄	6.350	¹ / ₂	12.700	¹ / ₈	3.175	13.894	0.584	1079	441	40	50	1.71
FR4	¹ / ₄	6.350	⁵ / ₈	15.875	²⁵ / ₁₂₈	4.978	17.526	1.067	1481	618	38	45	4.82
FR1810	⁵ / ₁₆	7.938	¹ / ₂	12.700	⁵ / ₃₂	3.967	13.894	0.787	540	275	40	48	1.54
FR6	³ / ₈	9.525	⁷ / ₈	22.225	⁷ / ₃₂	5.558	24.613	1.575	3335	1422	32	38	9.71
FR8	¹ / ₂	12.700	¹ / ₈	28.575	¹ / ₄	6.350	31.120	1.575	5111	2413	27	32	13.00

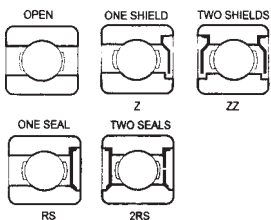
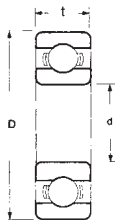
* All Bearings are available with stainless steel 440C

Inch Series* Flanged, Double Shielded



Bearing Number	Dimensions (mm)								Basic Load Ratings (N)		Limiting Speed X 10 ³ (rev/min)		Weight (g)
	Bore d		OD D		Width t		Flange Dia. D ₁	Flange Width t ₁	C _r	C _{gr}	Grease	Oil	
	inch	mm	inch	mm	inch	mm							
FR0ZZ	³ / ₆₄	1.191	⁵ / ₃₂	3.967	³ / ₃₂	2.380	5.156	0.787	108	34	110	130	0.20
FR1ZZ	⁷ / ₁₂₈	1.397	³ / ₁₆	4.762	⁷ / ₆₄	2.779	5.944	0.787	235	69	90	110	0.25
FR1-4ZZ	⁵ / ₆₄	1.984	¹ / ₄	6.350	⁹ / ₆₄	3.571	7.518	0.787	284	98	67	80	0.61
FR133ZZ	³ / ₃₂	2.380	³ / ₁₆	4.762	³ / ₃₂	2.380	5.944	0.787	147	54	80	95	0.21
FR1-5ZZ	³ / ₃₂	2.380	⁵ / ₁₆	7.938	⁹ / ₆₄	3.571	9.119	0.787	549	177	60	71	1.25
FR144JZZ	¹ / ₈	3.175	¹ / ₄	6.350	⁷ / ₆₄	2.779	7.518	0.787	314	108	67	80	0.40
FR144ZZ	¹ / ₈	3.175	¹ / ₄	6.350	⁷ / ₆₄	2.779	7.518	0.787	284	98	67	80	0.48
FR2-5ZZ	¹ / ₈	3.175	⁵ / ₁₆	7.938	⁹ / ₆₄	3.571	9.119	0.787	559	177	60	67	0.84
FR2-6ZZ	¹ / ₈	3.175	³ / ₈	9.525	⁹ / ₆₄	3.571	10.719	0.787	638	226	53	63	1.35
FR2ZZ	¹ / ₈	3.175	³ / ₈	9.525	⁵ / ₃₂	3.967	11.176	0.762	628	216	56	67	1.53
FR155ZZ	⁵ / ₃₂	3.967	⁵ / ₁₆	7.938	¹ / ₈	3.175	9.119	0.914	363	147	53	63	0.72
FR156ZZ	³ / ₁₆	4.762	⁵ / ₁₆	7.938	¹ / ₈	3.175	9.119	0.914	363	147	53	63	0.56
FR166ZZ	³ / ₁₆	4.762	³ / ₈	9.525	¹ / ₈	3.175	10.719	0.787	706	275	50	60	0.97
FR3ZZ	³ / ₁₆	4.762	¹ / ₂	12.700	²⁵ / ₁₂₈	4.978	14.351	1.067	1305	491	43	53	3.24
FR168ZZ	¹ / ₄	6.350	³ / ₈	9.525	¹ / ₈	3.175	10.719	0.914	373	177	48	56	0.73
FR188ZZ	¹ / ₄	6.350	¹ / ₂	12.700	³ / ₁₆	4.762	13.894	1.143	1079	441	40	50	2.54
FR4ZZ	¹ / ₄	6.350	⁵ / ₈	15.875	²⁵ / ₁₂₈	4.978	17.526	1.607	1481	618	38	45	4.90
FR1810ZZ	⁵ / ₁₆	7.938	¹ / ₂	12.700	⁵ / ₃₂	3.967	13.894	0.787	540	275	40	48	1.72
FR6ZZ	³ / ₈	9.525	⁷ / ₈	22.225	⁹ / ₃₂	7.142	24.613	1.575	3335	1422	32	38	12.39
FR8ZZ	¹ / ₂	12.700	¹ / ₈	28.575	⁵ / ₁₆	7.938	31.120	1.575	5111	2413	27	32	25.60

* All Bearings are available with stainless steel 440C material.



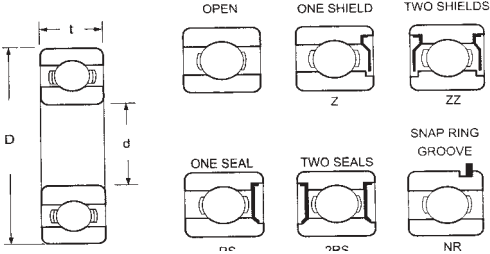
Deep Groove Ball Bearings

1600 Series

Inch

Bearing Number	Dimensions (inch)						Basic Load Ratings (lbs)		Weight kg
	Bore		OD		Width		Cr	Cor	
	Frac	Inch	Frac	Inch	Frac	Inch			
1601	3/16	0.1875	11/16	0.6875	1/4	0.2500	294	146	0.004
1602	1/4	0.2500	11/16	0.6875	1/4	0.2500	294	146	0.006
1603	5/16	0.3125	7/8	0.8750	9/32	0.2812	464	228	0.010
1604	3/8	0.3750	7/8	0.8750	9/32	0.2812	464	228	0.009
1605	5/16	0.3125	29/32	0.9062	5/16	0.3125	464	228	0.017
1606	3/8	0.3750	29/32	0.9062	5/16	0.3125	464	228	0.022
1607	7/16	0.4375	29/32	0.9062	5/16	0.3125	400	229	0.022
1614	3/8	0.3750	1-1/8	1.1250	3/8	0.3750	400	229	0.035
1615	7/16	0.4375	1/1/8	1.1250	3/8	0.3750	400	229	0.032
1616	1/2	0.5000	1-1/8	1.1250	3/8	0.3750	400	229	0.030
1620	7/16	0.4375	1-3/8	1.3750	7/16	0.4375	600	354	0.450
1621	1/2	0.5000	1-3/8	1.3750	7/16	0.4375	600	354	0.048
1622	9/16	0.5625	1-3/8	1.3750	7/16	0.4375	600	354	0.046
1623	5/8	0.6250	1-3/8	1.3750	7/16	0.4375	600	354	0.040
1628	5/8	0.6250	1-5/8	1.6250	1/2	0.5000	738	454	0.072
1630	3/4	0.7500	1-5/8	1.6250	1/2	0.5000	738	454	0.065
1633	5/8	0.6250	1-3/4	1.7500	1/2	0.5000	738	454	0.092
1635	3/4	0.7500	1-3/4	1.7500	1/2	0.5000	738	454	0.085
1638	3/4	0.7500	2	2.0000	9/16	0.5625	1100	709	0.120
1640	7/8	0.8750	2	2.0000	9/16	0.5625	1100	709	0.112
1641	1	1.0000	2	2.0000	9/16	0.5625	1100	709	0.100
1652	1-1/8	1.1250	2-1/2	2.5000	5/8	0.6250	1306	857	0.210
1654	1-1/4	1.1250	2-1/2	2.5000	5/8	0.6250	1306	857	0.190

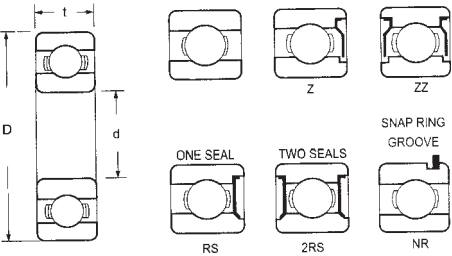
6000 Series



Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	Cr	Cor	Grease	Oil	
6000*	10	26	8	4620	1960	30000	36000	0.019
6001*	12	28	8	5070	2360	26000	32000	0.022
6002*	15	32	9	5590	2850	22000	28000	0.030
6003*	17	35	10	6050	3250	19000	24000	0.039
6004*	20	42	12	9360	5000	17000	20000	0.069
6005*	25	47	12	11200	6550	15000	18000	0.080
6006*	30	55	13	13300	8300	12000	15000	0.120
6007*	35	62	14	15900	10200	10000	13000	0.160
6008*	40	68	15	16800	11600	9500	12000	0.190
6009*	45	75	16	20800	14600	8000	11000	0.250
6010*	50	80	16	21600	16000	8500	10000	0.260
6011*	55	90	18	28100	21200	7500	9000	0.390
6012*	60	95	18	29600	23200	6700	8000	0.420
6013	65	100	18	30700	25000	6300	7500	0.440
6014	70	110	20	37700	31000	6000	7000	0.600
6015	75	115	20	39700	33500	5600	6700	0.640
6016	80	125	22	47500	40000	5300	6300	0.850
6017	85	130	22	49400	43000	5000	6000	0.890
6018	90	140	24	58500	50000	4800	5600	1.150
6019	95	145	24	60500	54000	4500	5300	1.200
6020	100	150	24	60500	54000	4300	5000	1.250

*The bearing is available in 440 c stainless steel

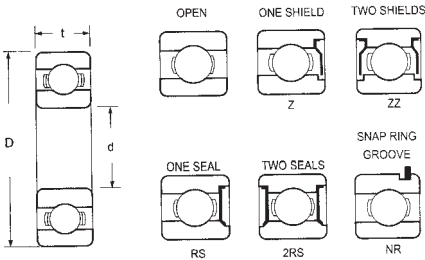
6200 Series



Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	C_r	C_{or}	Grease	Oil	
6200*	10	30	9	5070	2360	24000	30000	0.032
6201*	12	32	10	6890	3100	22000	28000	0.037
6202*	15	35	11	7800	3750	19000	24000	0.045
6203*	17	40	12	9560	4750	17000	20000	0.065
6204*	20	47	14	12700	6550	15000	18000	0.110
6205*	25	52	15	14000	7800	12000	15000	0.130
6206*	30	62	16	19500	11200	10000	13000	0.200
6207*	35	72	17	25500	15300	9000	11000	0.290
6208*	40	80	18	30700	19000	8500	10000	0.370
6209*	45	85	19	33200	21600	7500	9000	0.410
6210*	50	90	20	35100	23200	7000	8500	0.460
6211*	55	100	21	43600	29000	6300	7500	0.610
6212*	60	110	22	47500	32500	6000	7000	0.780
6213	65	120	23	55900	40500	5300	6300	0.990
6214	70	125	24	60500	45000	5000	6000	1.050
6215	75	130	25	66300	49000	4800	5600	1.200
6216	80	140	26	70200	55000	4500	5300	1.400
6217	85	150	28	83200	64000	4300	5000	1.800
6218	90	160	30	95600	73200	3800	4500	2.150
6219	95	170	32	10800	81500	3600	4300	2.600
6220	100	180	34	124000	93000	3400	4000	3.150

*The bearing is available in 440 c stainless steel

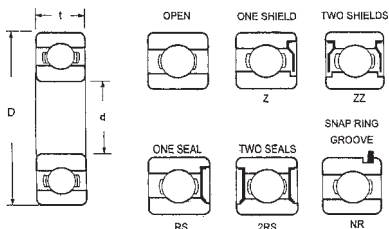
6300 Series



Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	<i>Cr</i>	<i>Cor</i>	Grease	Oil	
6300*	10	35	11	8060	3400	20000	26000	0.053
6301*	12	37	12	9750	4150	19000	24000	0.060
6302*	15	42	13	11400	5400	17500	22000	0.088
6303*	17	47	14	13500	6550	16000	19000	0.120
6304*	20	52	15	15900	7800	13000	16000	0.140
6305*	25	62	17	22500	11600	11000	14000	0.230
6306*	30	72	19	28100	16000	9000	11000	0.350
6307*	35	80	21	33200	19000	8500	10000	0.460
6308*	40	90	23	41000	24000	7500	9000	0.630
6309*	45	100	25	52700	31500	6700	8000	0.830
6310*	50	110	27	61800	38000	6300	7500	1.050
6311*	55	120	29	71500	45000	5600	6700	1.350
6312	60	130	31	81900	52000	5000	6000	1.700
6313	65	140	33	92300	60000	4800	5600	2.100
6314	70	150	35	104000	68000	4500	5300	2.500
6315	75	160	37	114000	76500	4300	5000	3.000
6316	80	170	39	123000	86500	4000	4800	3.65
6317	85	180	41	132000	97100	3800	4500	4.28
6318	90	190	43	143000	106500	3600	4300	4.98
6319	95	200	45	153000	119000	3100	3600	5.76
6320	100	215	47	173000	141200	2800	3400	7.04

*The bearing is available in 440 c stainless steel

6400 Series



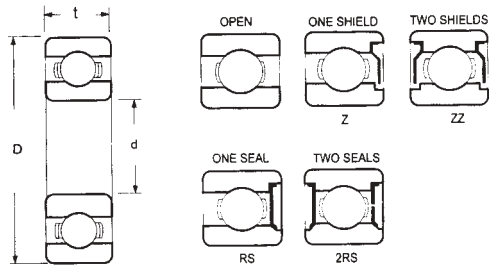
Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	C_r	C_{or}	Grease	Oil	
6403	17	62	17	22.7	10.8	11000	15000	0.268
6404	20	72	19	31.0	15.2	9500	13000	0.399
6405	25	80	21	38.2	19.2	8500	11000	0.528
6406	30	90	23	47.5	24.5	8000	10000	0.710
6407	35	100	25	56.8	29.5	6700	8500	0.926
6408	40	110	27	65.5	37.5	6300	8000	1.22
6409	45	120	29	77.5	45.5	5600	7000	1.52
6410	50	130	31	92.2	55.2	5300	6300	1.85

*The bearing is available in 440 c stainless steel

6700 Series

Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed x 10 ³ (rev/min)		Weight (g)
	Bore d	OD D	Width t	Cr	Cor	grease	oil	
6700	10	15	3	853	432	15000	17000	1.4
6701	12	18	4	922	530	13000	15000	3.1
6702	15	21	4	942	579	11000	13000	3.6
6703	17	23	4	1001	657	9500	11000	4.0
6704	20	27	4	1040	726	8500	10000	5.9
6705	25	32	4	1089	844	7000	8000	7.1
6706	30	37	4	1148	952	5500	7000	8.3
6707	35	44	5	1864	1638	4900	6000	15.0
6708	40	50	6	2521	2237	4300	5000	23.0
6709	45	55	6	2580	2403	3900	4600	25.0

6800 Series

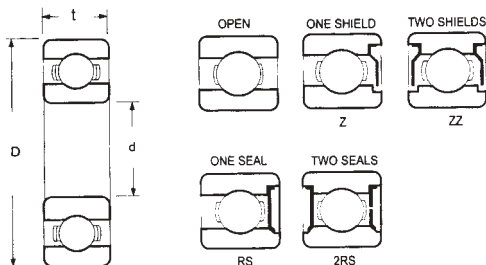


Deep Groove Ball Bearing

Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed (rev/min)		Weight (kg)
	Bore d	OD D	Width t	Cr	Cor			
						grease	oil	
6800*	10	19	5	1380	585	37000	43000	0.0055
6801*	12	21	5	1430	670	33000	39000	0.0063
6802*	15	24	5	1560	800	28000	33000	0.0074
6803*	17	26	5	1680	930	26000	30000	0.0082
6804*	20	32	7	2700	1500	21000	25000	0.0180
6805*	25	37	7	4360	2600	18000	21000	0.0220
6806*	30	42	7	4490	2900	15000	18000	0.0270
6807*	35	47	7	4750	3200	13000	16000	0.0300
6808*	40	52	7	4940	3450	12000	14000	0.0340
6809*	45	58	7	6050	4300	11000	13000	0.0400
6810*	50	65	7	6240	4750	10000	12000	0.0520
6811*	55	72	9	8320	6200	8500	10000	0.0830
6812*	60	78	10	8710	6700	80000	9500	0.1100
6813	65	85	10	11700	9150	7500	8500	0.1300
6814	70	90	10	12100	1000	7000	8000	0.1400
6815	75	95	10	12500	10800	6500	7500	0.1500
6816	80	100	10	12400	10800	6000	7000	0.1500
6817	85	110	13	19500	16600	5500	6500	0.2700
6818	90	115	13	19500	17000	5300	6200	0.2800
6819	95	120	13	19900	17600	5000	6000	0.3000
6820	100	125	13	19900	18300	4600	5500	0.3100

* The bearing is available in 440 c stainless steel

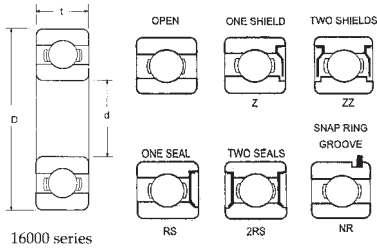
6900 Series



Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed (rev/min)		Weight (kg)
	Bore d	OD D	Width t	Cr	Cor			
						grease	oil	
6900*	10	22	6	1950	750	34000	41000	0.010
6901*	12	24	6	2250	980	31000	36000	0.011
6902*	15	28	7	4030	2040	26000	30000	0.016
6903*	17	30	7	4360	2320	23000	28000	0.018
6904*	20	37	9	6370	3650	19000	23000	0.038
6905*	25	42	9	6630	4000	16000	19000	0.045
6906*	30	47	9	7280	4550	14000	17000	0.051
6907*	35	55	10	9560	6200	12000	14000	0.080
6908*	40	62	12	13800	9300	11000	13000	0.120
6909*	45	68	12	10100	6700	10700	12000	0.140
6910*	50	72	12	14600	10400	9500	11000	0.140
6911*	55	80	13	15900	11400	8000	9000	0.190
6912*	60	85	13	16500	12000	7500	8500	0.200
6913	65	90	13	17400	13400	7000	8000	0.220
6914	70	100	16	23800	18300	6500	7500	0.350
6915	75	105	16	24200	19300	6200	7200	0.370
6916	80	110	16	25100	20400	5500	6500	0.400
6917	85	120	18	31900	30000	52500	6300	0.550
6918	90	125	18	33200	31500	5000	6000	0.590
6919	95	130	18	33800	33500	4700	5500	0.610
6920	100	140	20	42300	41500	4400	5300	0.830

*The bearing is available in 440 c stainless steel

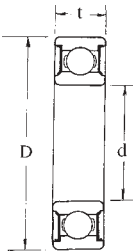
16000 Series



16000 series

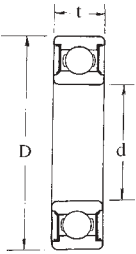
Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	Cr	Cor	Grease	Oil	
16100	10	28	8	4620	1960	28000	34000	0.023
16001	12	28	7	5070	2360	26000	32000	0.019
16002	15	32	8	5590	2850	22000	28000	0.025
16003	17	35	8	6050	3250	19000	24000	0.032
16004	20	42	8	6890	4050	17000	20000	0.050
16005	25	47	8	7610	4750	14000	17000	0.060
16006	30	55	9	11200	7350	12000	15000	0.085
16007	35	62	9	12400	8150	10000	13000	0.110
16008	40	68	9	13300	9150	9500	12000	0.130
16009	45	75	10	15600	10800	9000	11000	0.170
16010	50	80	10	16300	11400	8500	10000	0.180
16011	55	90	11	19500	14000	7500	9000	0.260
16012	60	95	11	19900	15000	6700	8000	0.280
16013	65	100	11	21200	16600	6300	7500	0.300
16014	70	110	13	28100	25000	6000	7000	0.430
16015	75	115	13	28600	27000	5600	6700	0.460

62200 Series

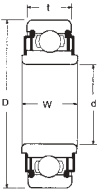


Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed (rev/min)	Weight (kg)
	Bore d	OD D	Width t	Cr	Cor		
62200-2RS	10	30	14	3.7	1.7	14,500	0.042
62201-2RS	12	32	14	4.9	2.7	14,000	0.046
62202-2RS	15	35	14	5.5	3.2	12,500	0.056
62203-2RS	17	40	16	6.9	4.0	11,000	0.085
62204-2RS	20	47	18	9.8	6.1	9,500	0.128
62205-2RS	25	52	18	10.5	6.8	8,300	0.146
62206-2RS	30	62	20	14.7	9.8	7,000	0.242
62207-2RS	35	72	23	19.4	12.7	6,000	0.435
62208-2RS	40	80	23	20.6	14.2	5,100	0.450
62209-2RS	45	85	23	22.5	15.6	4,700	0.485
62210-2RS	50	90	23	24.5	18.1	4,300	0.535

63000 Series



Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speed (rev/min)	Weight (kg)
	Bore d	OD D	Width t	Cr	Cor	Grease	
63000-2RS	10	26	12	360	185	17,500	0.028
63001-2RS	12	28	12	390	215	15,500	0.032
63002-2RS	15	32	13	440	260	13,500	0.042
63003-2RS	17	35	14	470	290	11,500	0.051
63004-2RS	20	42	16	730	460	10,000	0.088
63005-2RS	25	47	16	780	530	8900	0.100
63006-2RS	30	55	19	1040	740	7500	0.159
63007-2RS	35	62	20	1200	910	6600	0.210
63008-2RS	40	68	21	1280	1010	6000	0.259
63009-2RS	45	75	23	1600	1330	5300	0.345
63010-2RS	50	80	23	1690	1430	5000	0.370

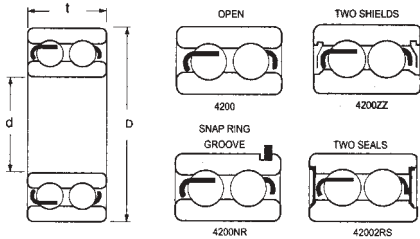


88000 series

88000 Series

Bearing Number	Dimensions (mm)				Basic Load Ratings (N)		Weight kg
	d	D	t	W	Cr	Cor	
88011	11	32	10	15.400	1050	595	0.099
88501	12	32	10	15.400	1050	595	0.095
88013	13	32	10	15.400	1050	595	0.091
88014	14	35	11	14.399	1340	775	0.111
88502	15	35	11	14.399	1340	775	0.108
88016	16	35	11	17.000	1980	1200	0.188
88503	17	40	12	16.601	1660	985	0.150
88504	20	47	14	17.750	2220	1410	0.232
88505	25	52	15	16.749	2430	1610	0.287

Deep Groove Ball Bearings-
Double Row
4200 Series

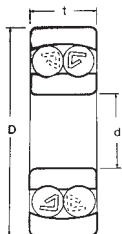


Self Aligning Ball Bearings

Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	<i>C_r</i>	<i>C_{or}</i>	Grease	Oil	
4200	10	30	14	9230	5200	18000	22000	0.049
4201	12	32	14	10600	6200	17000	20000	0.053
4202	15	35	14	11900	7500	14000	17000	0.059
4203	17	40	16	14800	9500	12000	15000	0.09
4204	20	47	18	17800	12500	10000	13000	0.14
4205	25	52	18	19000	14600	9000	11000	0.16
4206	30	62	20	26000	20800	8000	9500	0.26
4207	35	72	23	35100	28500	6700	8000	0.4
4208	40	80	23	37100	32500	6000	7000	0.5
4209	45	85	23	39000	36000	5600	6700	0.54
4210	50	90	23	41000	40000	5000	6000	0.58
4211	55	100	25	44900	44000	4800	5600	0.8
4212	60	110	28	57200	55000	4500	5300	1.1
4213	65	120	31	67600	67000	4000	4800	1.45
4214	70	125	31	70200	73500	3600	4300	1.5
4215	75	130	31	72800	80000	3400	4000	1.6

4300 Series

Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	<i>C_r</i>	<i>C_{or}</i>	Grease	Oil	
4300	10	35	17	14300	8750	8600	17500	0.091
4301	12	37	17	14700	9200	8100	16000	0.1
4302	15	42	17	15300	9130	13000	17000	0.12
4303	17	47	19	20500	13200	11000	17000	0.16
4304	20	52	21	24300	16000	9500	13000	0.21
4305	25	62	24	32900	22400	8000	10000	0.34
4306	30	72	27	41000	30600	6700	8500	0.5
4307	35	80	31	53200	38200	6300	8000	0.69
4308	40	90	33	65100	47900	5600	7000	0.95
4309	45	100	36	74800	60000	4800	6000	1.25
4310	50	110	40	92600	75500	4300	5300	1.7
4311	55	120	43	10800	88500	4000	5000	2.15
4312	60	130	46	125000	104000	3600	4500	2.65
4313	65	140	48	134000	113000	3600	4500	3.25
4314	70	150	51	152000	131000	3200	4500	3.95
4315	75	160	55	176000	154000	3000	3800	5.38



Self-Aligning Ball Bearings

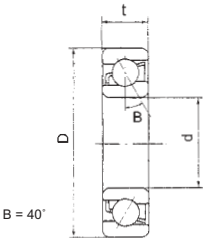
1200 Series & 2200 Series

Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	C_r	C_{or}	Grease	Oil	
1200	10	30	9	5.50	1.20	23000	28000	0.034
1201	12	32	10	5.60	1.25	21000	26000	0.040
1202	15	35	11	7.45	1.75	18000	22000	0.049
1203	17	40	12	7.90	2.00	16000	20000	0.073
1204	20	47	14	9.90	2.60	14000	17000	0.120
1205	25	52	15	12.10	3.30	12000	14000	0.141
1206	30	62	16	15.60	4.65	9900	12000	0.220
1207	35	72	17	15.80	5.10	8500	10000	0.323
1208	40	80	18	19.20	6.50	7500	9200	0.417
1209	45	85	19	21.80	7.35	7000	8500	0.456
1210	50	90	20	22.70	8.10	6500	7900	0.525
1211	55	100	21	26.80	10.00	5800	7100	0.705
1212	60	110	22	30.20	11.50	5200	6400	0.900
1213	65	120	23	31.00	12.50	4800	5800	1.150
1214	70	125	24	34.60	13.80	4600	5700	1.260
1215	75	130	25	38.80	15.70	4300	5300	1.360

2201	12	32	14	7.65	1.75	2100	2600	0.053
2202	15	35	14	7.70	1.85	1800	22000	0.060
2203	17	40	16	9.80	2.40	1600	20000	0.088
2204	20	47	18	12.60	3.30	1400	17000	0.140
2205	25	52	18	12.60	3.50	1200	15000	0.163
2206	30	62	20	15.60	4.65	1000	12000	0.260
2207	35	72	23	21.60	6.60	8500	10000	0.403
2208	40	80	23	22.40	7.40	7600	9300	0.505
2209	45	85	23	23.30	8.15	7000	8500	0.545
2210	50	90	23	23.30	8.50	6500	7900	0.590
2211	55	100	25	26.80	10.00	5800	7100	0.810
2212	60	110	28	34.10	12.60	5300	6500	1.090

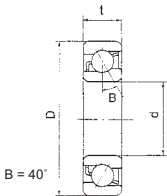
*For Tapered Bore bearings add K to the Bearing No

Angular Contact Ball Bearings
7200 Series



Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	<i>Cr</i>	<i>Cor</i>	Grease	Oil	
7200 B	10	30	9	7020	3350	19000	28000	0.030
7201 B	12	32	10	7610	3800	18000	26000	0.036
7202 B	15	35	11	8840	4800	17000	24000	0.045
7203 B	17	40	12	11100	6100	15000	20000	0.065
7204 B	20	47	14	14000	8300	12000	17000	0.110
7205 B	25	52	15	15600	10200	10000	15000	0.130
7206 B	30	62	16	23800	15600	8500	12000	0.200
7207 B	35	72	17	30700	20800	8000	11000	0.280
7208 B	40	80	18	36400	26000	7000	9500	0.370
7209 B	45	85	19	37700	28000	6700	9000	0.420
7210 B	50	90	20	39000	30500	6000	8000	0.470
7211 B	55	100	21	48800	38000	5600	7500	0.620
7212 B	60	110	22	57200	45500	5000	6700	0.800
7213 B	65	120	23	66300	54000	4500	6000	1.000
7214 B	70	125	24	71500	60000	4300	5600	1.100
7215 B	75	130	25	72800	64000	4300	5600	1.200
7216 B	80	140	26	83200	73500	3800	5000	1.450
7217 B	85	150	28	95600	83000	36000	4800	1.850
7218 B	90	160	30	10800	96500	3400	4500	2.300
7219 B	95	170	32	124000	108000	3200	4300	2.700
7220 B	100	180	34	135000	122000	3000	4000	3.300
7221 B	105	190	36	148000	137000	2800	3800	3.950
7222 B	120	200	38	163000	153000	2600	3600	4.600
7224 B	100	215	40	165000	163000	2200	3200	6.100

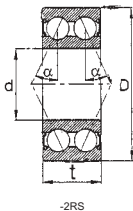
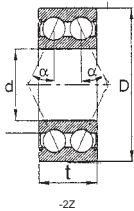
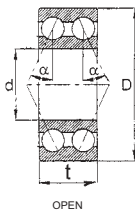
7300 Series



Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Width t	<i>Cr</i>	<i>Cor</i>	Grease	Oil	
7302 B	15	42	13	13000	6700	15000	20000	0.08
7303 B	17	47	14	15900	8300	13000	18000	0.11
7304 B	20	52	15	19000	10400	11000	16000	0.14
7305 B	25	62	17	26000	15600	9000	13000	0.23
7306 B	30	72	19	34500	21200	8000	11000	0.34
7307 B	35	80	21	39000	24500	7500	10000	0.45
7308 B	40	90	23	49400	33500	6700	9000	0.63
7309 B	45	100	25	60500	41500	6000	8000	0.85
7310 B	50	110	27	74100	51000	5300	7000	1.10
7311 B	55	120	29	85200	60000	4800	6300	1.40
7312 B	60	130	31	95600	69500	4500	6000	1.75
7313 B	65	140	33	108000	80000	4300	5600	2.15
7314 B	70	150	35	119000	90000	3800	5000	2.65
7315 B	75	160	37	133000	106000	3600	4800	3.20
7316 B	80	170	39	143000	118000	3400	4500	3.80
7317 B	85	180	41	153000	132000	3200	4300	4.45
7318 B	90	190	43	165000	146000	3000	4000	5.20
7319 B	95	200	45	178000	163000	2800	3800	6.05
7320 B	100	215	47	203000	190000	2600	3600	7.50

Angular Contact Ball Bearings

Angular Contact Ball Bearings
Double Row
5200 Series



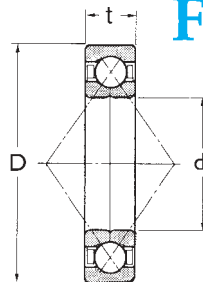
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Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore	OD	Width	<i>Cr</i>	<i>Cor</i>	Grease	Oil	
	d	D	t					
5200	10	30	14.287	6.95	3.80	14000	19000	0.094
5201	12	32	15.875	9.15	5.05	13000	17000	0.057
5202	15	35	15.875	10	6.05	11000	15000	0.064
5203	17	40	17.462	13.2	8.15	11000	14000	0.091
5204	20	47	20.638	19.7	12.60	8800	12000	0.120
5205	25	52	20.638	21.4	14.80	7700	10000	0.190
5206	30	62	23.812	29.7	21.30	6400	8600	0.290
5207	35	72	26.988	39.2	29.00	5500	7300	0.430
5208	40	80	30.162	44.4	33.60	5000	6700	0.570
5209	45	85	30.162	49.9	38.40	4600	6100	0.620
5210	50	90	30.162	53.3	43.60	4300	5600	0.670
5211	55	100	33.338	65.9	55.20	3800	5100	0.960
5212	60	110	36.512	74.4	60.80	3500	4700	1.360
5213	65	120	38.100	86.9	75.30	3200	4300	1.660
5214	70	125	39.688	94.5	82.60	3100	4100	1.810
5215	75	130	41.275	92.4	120.00	2900	3900	2.100

5300 Series

Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore	OD	Width	<i>Cr</i>	<i>Cor</i>	Grease	Oil	
	d	D	t					
5302	15	42	19	17.2	10.1	9900	13000	0.132
5303	17	47	22.2	20.4	12.1	9000	12000	0.181
5304	20	52	22.2	20.6	12.7	8000	11000	0.217
5305	25	62	25.4	30.5	20.5	6700	8900	0.362
5306	30	72	30.2	39.5	27.5	5700	7600	0.553
5307	35	80	34.9	49.5	35	5000	6600	0.766
5308	40	90	36.5	60.5	44	4400	5900	1.01
5309	45	100	39.7	72.5	54	4000	5300	1.34
5310	50	110	44.4	85.5	64.5	3600	4800	1.81
5311	55	120	49.2	106	82	3300	4400	2.32
5312	60	130	54	122	95.5	3000	4000	3.05
5313	65	140	58.7	138	109	2800	3700	3.96
5314	70	150	63.5	155	125	2600	3500	4.74
5315	75	160	68.3	168	141	2400	3200	5.65

QJ 200 Series

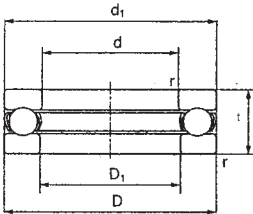


Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore	OD	Width	C_r	C_{or}	Grease	Oil	
	d	D	t					
QJ208	40	80	18	350	650	6900	9200	0.450
QJ209	45	85	19	400	740	6200	8200	0.520
QJ210	50	90	20	410	800	5600	7500	0.603
QJ211	55	100	21	510	1000	5100	6800	0.780
QJ212	60	110	22	620	1240	4700	6300	0.987
QJ213	65	120	23	680	1380	4400	5800	1.24
QJ214	70	125	24	730	1520	4000	5400	1.36
QJ215	75	130	25	770	1630	3800	5000	1.53
QJ216	80	140	26	900	1940	3500	4700	1.83
QJ217	85	150	28	1000	2240	3300	4400	2.30
QJ218	90	160	30	1180	2630	3100	4200	2.76
QJ219	95	170	32	1350	3120	3000	3900	3.35
QJ220	100	180	34	1450	3220	2800	3700	4.02
QJ221	105	190	36	1570	3620	2700	3600	4.75
QJ222	110	200	38	1700	4030	2500	3400	5.62
QJ224	120	215	40	1930	4840	2300	3100	6.75

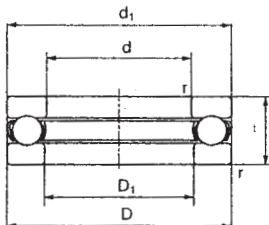
QJ 300 Series

Bearing Number	Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	Bore	OD	Width	C_r	C_{or}	Grease	Oil	
	d	D	t					
QJ306	30	72	19	320	540	8000	11000	0.420
QJ307	35	80	21	400	690	7000	9300	0.570
QJ308	40	90	23	500	860	6200	8200	0.078
QJ309	45	100	25	630	1150	5500	7400	1.05
QJ310	50	110	27	740	1380	5000	6700	1.38
QJ311	55	120	29	850	1610	4600	6100	1.76
QJ312	60	130	31	970	1880	4200	5700	2.18
QJ313	65	140	33	1100	2150	3900	5200	2.70
QJ314	70	150	35	1230	2450	3600	4800	3.27
QJ315	75	160	37	1350	2780	3400	4500	3.90
QJ316	80	170	39	1460	3100	3200	4200	4.64
QJ317	85	180	41	1600	3460	3000	4000	5.43
QJ318	90	190	43	1680	3820	2800	3800	6.31
QJ319	95	200	45	1800	4230	2700	3500	7.41
QJ320	100	215	47	2180	5500	2500	3400	9.14
QJ321	105	225	49	2180	5500	2400	3200	10.4
QJ322	110	240	50	1427	6470	2300	3100	12.0
QJ324	120	260	55	2590	7140	2100	2800	15.9

Series 2900

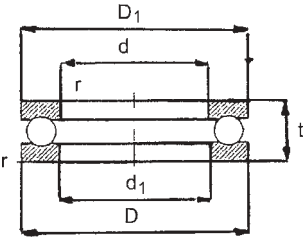


Bearing Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	d	D	t	D ₁ (min)	d ₁ (max)	r (min)	Cr	Cor	Grease	Oil	
2900	10	26	12	10.2	26	0.6	12700	17100	5600	8400	0.035
2901	12	28	12	12.2	28	0.6	13200	19000	5400	8100	0.037
2902	15	31	12	15.2	31	0.6	14300	22800	5100	7700	0.041
2903	18	35	12	18.2	35	0.6	14400	24700	4800	7300	0.045
2904	20	37	12	20.2	37	0.6	14800	26600	4700	7100	0.055
2904-1/2	22	42	14	22.2	42	0.6	18900	34500	4100	6100	0.085
2905	25	45	14	25.2	45	0.6	19300	37000	3900	5900	0.093
2906	30	50	14	30.2	50	0.6	20200	42000	3700	5600	0.107
2907	35	55	16	35.2	55	0.6	29900	62000	3300	5000	0.137
2908	40	60	16	40.2	60	0.6	31000	70000	3200	4800	0.150
2909	45	68	16	45.2	68	0.6	32500	77500	3000	4500	0.199
2910	50	74	18	50.2	74	0.6	38500	94000	2700	4100	0.255
2911	55	78	18	55.2	78	0.6	40000	103000	2600	4000	0.270
2912	60	82	18	60.2	82	0.6	40500	108000	2600	3900	0.275
2913	65	90	20	65.2	90	0.6	47500	129000	2300	3500	0.374
2914	70	95	20	70.2	95	0.6	49000	140000	2200	3400	0.400
2915	75	100	20	75.2	100	0.6	51000	151000	2200	3300	0.425
2916	80	110	22	80.2	110	0.6	57000	171000	2000	3000	0.600
2917	85	115	22	85.2	115	0.6	59000	184000	1900	2900	0.640
2918	90	120	22	90.2	120	0.6	59500	190000	1900	2900	0.670
2919	95	130	25	95.2	130	0.6	75500	236000	1700	2600	0.795
2920	100	135	25	100.2	135	0.6	78000	253000	1700	2500	0.930
2921	105	140	25	105.2	140	0.6	78500	262000	1600	2500	1.02
2922	110	145	25	110.2	145	0.6	78000	262000	1600	2400	1.15
2923	115	150	25	115.2	150	0.6	73500	245000	1600	2400	1.25
2924	120	160	27	120.2	160	0.6	94000	314000	1500	2200	1.35
2925	125	160	27	125.3	165	0.6	85500	298000	1400	2200	1.48
2928	140	185	31	140.3	185	0.6	106000	375000	1300	1900	2.33



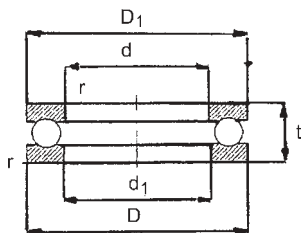
Bearing Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	d	D	t	D ₁ (min)	d ₁ (max)	r (min)	Cr	Cor	Grease	Oil	
3905	25	52	16	25.2	52	1	27100	50500	3400	5200	0.147
3906	30	60	19	30.2	60	1	38000	72500	2900	4400	0.237
3907	35	68	22	35.2	68	1	50500	99000	2500	3800	0.346
3908	40	76	25	40.2	76	1	61000	119000	2200	3400	0.486
3909	45	85	28	45.2	85	1	79500	163000	2000	3000	0.684
3910	50	92	31	50.2	92	1	97000	202000	1800	2800	0.889
3911	55	100	33	55.2	100	1	110000	240000	1700	2600	1.114
3912	60	106	35	60.2	106	1.5	119000	263000	1600	2400	1.293
3913	65	112	36	65.2	112	1.5	128000	287000	1500	2300	1.443
3914	70	120	38	70.2	120	1.5	143000	335000	1400	2200	1.767
3915	75	128	41	75.2	128	1.5	159000	365000	1300	2000	2.132
3916	80	136	44	80.2	136	1.5	183000	425000	1200	1900	2.606
3917	85	145	47	85.2	145	1.5	207000	490000	1100	1700	3.157
3918	90	155	50	90.2	155	1.5	232000	555000	1100	1600	3.907
3919	95	165	54	95.2	165	1.5	253000	630000	1000	1500	4.810
3920	110	172	57	100.2	172	1.5	250000	630000	980	1400	5.454
3921	115	180	60	105.2	180	2.5	257000	670000	930	1400	6.354
3922	110	190	63	110.2	190	2.5	293000	785000	880	1300	7.333
3923	115	200	66	115.2	200	2.5	315000	870000	840	1200	8.526
3924	120	210	69	120.5	210	2.5	325000	930000	800	1200	10.195

Series 51100



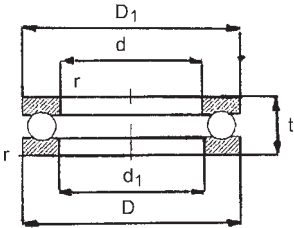
Bearing Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	d	D	t	d ₁	D ₁	r	Cr	Cor	Grease	Oil	
51100	10	24	9	11	24	0.3	9950	14000	7000	9500	0.02
51101	12	26	9	13	26	0.3	10400	15300	6700	9000	0.022
51102	15	28	9	16	28	0.3	9360	14000	6300	8500	0.023
51103	17	30	9	18	30	0.3	9750	15300	6300	8500	0.025
51104	20	35	10	20	35	0.3	12700	20800	5600	7500	0.038
51105	25	42	11	26	42	0.6	15900	29000	4800	6300	0.056
51106	30	47	11	32	47	0.6	16800	33500	4500	6000	0.063
51107	35	52	12	37	52	0.6	17400	37500	4300	5600	0.08
51108	40	60	13	42	60	0.6	23400	50000	3800	5000	0.12
51109	45	65	14	47	65	0.6	24200	57000	3400	4500	0.14
51110	50	70	14	52	70	0.6	25500	63000	3200	4300	0.16
51111	55	78	16	57	78	0.6	30700	78000	2800	3800	0.23
51112	60	85	17	62	85	1.0	35800	90000	2600	3600	0.2
51113	65	90	18	67	90	1.0	37100	98000	2400	3400	0.33
51114	70	95	18	72	95	1.0	37700	104000	2400	3400	0.35
51115	75	100	19	77	100	1.0	44200	137000	2200	3200	0.4
51116	80	105	19	82	105	1.0	44900	140000	2000	3000	0.42
51117	85	110	19	87	110	1.0	46200	150000	2000	3000	0.44
51118	90	120	22	92	120	1.0	59200	190000	1800	2600	0.67
51120	100	135	25	102	135	1.0	85200	270000	1700	2400	0.97
51122	110	145	25	112	145	1.0	87100	290000	1600	2200	1.05
51124	120	155	25	122	155	1.0	88400	310000	1600	2200	1.15
51126	130	170	30	132	170	1.0	111000	390000	1400	1900	1.85
51128	140	180	31	142	178	1.0	111000	400000	1300	1800	2.05
51130	150	190	31	152	188	1.0	111000	400000	1200	1700	2.2

Series 51200



Bearing Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	d	D	t	d ₁	D ₁	r	C _r	C _{or}	Grease	Oil	
51200	10	26	11	12	26	0.6	12700	17000	6000	8000	0.031
51201	12	28	11	14	28	0.6	12300	19000	6000	8000	0.034
51202	15	32	12	17	32	0.6	16500	25000	5300	7000	0.046
51203	17	35	12	19	35	0.6	17200	27500	5000	6700	0.053
51204	20	40	14	22	40	0.6	22500	37500	4500	6000	0.083
51205	25	47	15	27	47	0.6	27600	50000	4000	5300	0.110
51206	30	52	16	32	52	0.6	25500	47500	3600	4800	0.130
51207	35	62	18	37	62	1.0	35100	67000	3000	4000	0.220
51208	40	68	19	42	68	1.0	46800	98000	2800	3800	0.280
51209	45	73	20	47	73	1.0	3900	80000	2600	3600	0.300
51210	50	78	22	52	78	1.0	49400	106000	2400	3400	0.370
51211	55	90	25	57	90	1.0	61800	134000	1900	2800	0.590
51212	60	95	26	62	95	1.0	62400	140000	1900	2800	0.650
51213	65	100	27	67	100	1.0	63700	150000	1800	2600	0.780
51214	70	105	27	72	105	1.0	65000	160000	1800	2600	0.790
51215	75	110	27	77	110	1.0	67600	170000	1700	2400	0.830
51216	80	115	28	82	115	1.0	76100	190000	1700	2400	0.910
51217	85	125	31	88	125	1.0	97500	250000	1600	2200	1.200
51218	90	135	35	93	135	1.1	119000	300000	1500	2000	1.700
51220	100	150	38	103	150	1.1	124000	320000	1300	1800	2.200
51222	110	150	38	113	160	1.1	130000	360000	1200	1700	2.400
51224	120	170	39	123	170	1.1	140000	400000	1100	1600	2.650
51226	130	190	45	133	187	1.5	186000	540000	950	1400	4.000
51228	140	200	46	143	197	1.5	190000	570000	950	1400	4.350
51230	150	215	50	153	212	1.5	238000	730000	900	1300	6.100

Series 51300

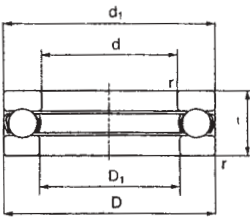


Bearing Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	d	D	t	d ₁	D ₁	r	Cr	Cor	Grease	Oil	
51305	25	52	18	27	52	1.0	34500	55000	3400	4500	0.17
51306	30	60	21	32	60	1.0	37700	65500	2800	3800	0.26
51307	35	68	24	37	68	1.0	49400	88000	2400	3400	0.38
51308	40	78	26	42	78	1.0	61800	112000	2000	3000	0.53
51309	45	85	28	47	85	1.0	76100	140000	1900	2800	0.66
51310	50	95	31	52	95	1.1	88400	173000	18000	2600	0.94
51311	55	105	35	57	105	1.1	104000	208000	1600	2200	1.30
51312	60	110	35	62	110	1.1	101000	208000	1600	2200	1.35
51313	65	115	36	67	115	1.1	106000	220000	1500	2000	1.50
51314	70	125	40	72	125	1.1	135000	300000	1400	1900	2.00
51315	75	135	44	77	135	1.5	163000	360000	1200	1700	2.60
51316	80	140	44	82	140	1.5	159000	360000	1200	1700	2.70
51317	85	150	49	88	150	1.5	190000	425000	1100	1600	3.55
51318	90	155	50	93	155	1.5	195000	465000	1000	1500	3.80
51320	100	170	55	103	170	1.5	229000	560000	950	1400	4.95
51322	110	190	63	113	187	2.0	276000	720000	850	1200	7.85
51324	120	210	70	123	205	2.1	325000	915000	800	1100	11.00

Series 51400

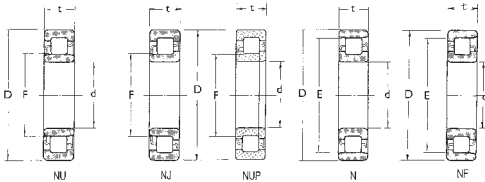
51405	25	60	24	27	60	1.0	55300	90000	2600	3600	0.34
51406	30	70	28	32	70	1.0	72800	125000	2000	3000	0.52
51407	35	80	32	37	80	1.0	87100	156000	1800	2600	0.76
51408	40	90	36	42	90	1.1	112000	204000	1700	2400	1.10
51409	45	100	39	47	100	1.1	130000	240000	1600	2200	1.40
51410	50	110	43	52	110	1.5	159000	310000	1500	2000	2.00
51411	55	120	48	57	120	1.5	178000	360000	1300	1800	2.55
51412	60	130	51	62	130	1.5	199000	400000	1100	1600	3.10
51413	65	140	56	68	140	2.0	215000	448000	1000	1500	4.67
51414	70	150	60	73	150	2.0	235000	499000	980	1400	5.72
51415	75	160	65	78	160	2.0	251000	560000	900	1300	6.75

Thrust Ball Bearings – Inch Series 0



Bearing Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	d	D	t	D ₁ (min)	d ₁ (max)	r (min)	Cr	Cor	Grease	Oil	
0- 3	9.525	25.400	13.494	9.925	24.606	0.8	11800	15200	5400	8100	0.036
0- 4	12.700	32.544	15.875	13.097	31.750	0.8	18600	25100	4300	6500	0.077
0- 5	15.875	35.719	15.875	16.272	34.925	0.8	19400	28300	4100	6200	0.086
0- 6	19.050	38.894	15.875	19.447	38.100	0.8	21400	64500	4000	6000	0.095
0- 7	22.225	42.069	15.875	22.622	41.275	0.8	21900	37500	3800	5800	0.100
0- 8	25.400	45.244	15.875	25.797	44.450	1.6	22500	41000	3700	5500	0.110
0- 9	28.575	48.419	15.875	28.972	47.625	1.6	24100	47000	3600	5400	0.128
0-10	31.750	53.181	18.256	32.147	52.388	1.6	27900	54500	3200	4800	0.164
0-11	34.925	56.356	18.256	35.322	55.562	1.6	28600	58000	3100	4600	0.186
0-12	38.100	59.531	18.256	38.497	58.738	1.6	30500	3000	4500	4500	0.200
0-13	41.275	62.706	18.256	41.672	61.912	1.6	26700	63000	2900	4400	0.210
0-14	44.450	68.262	19.050	44.847	67.469	1.6	321500	77500	2700	4100	0.260
0-15	47.625	71.438	19.050	48.021	70.644	1.6	37500	89000	2700	4000	0.285
0-16	50.800	75.406	19.050	51.594	74.613	2.4	38000	94000	2600	3900	0.300
0-17	53.975	81.756	22.225	54.769	10.962	2.4	49500	118000	2300	3500	0.405
0-18	57.150	84.931	22.225	57.944	84.138	2.4	50500	125000	2300	3400	0.405
0-19	60.325	91.281	25.400	61.119	90.488	2.4	58000	145000	2000	3100	0.590
0-20	63.500	94.456	25.400	64.294	93.662	2.4	59500	152000	2000	3000	0.610
0-21	66.675	97.631	25.400	67.469	96.838	2.4	60500	160000	1900	2900	0.660
0-22	69.850	102.394	25.400	70.644	101.600	2.4	71500	179000	70.644	101.600	0.700
0-23	73.025	105.569	25.400	73.819	104.775	2.4	75500	199000	1900	2800	0.730
0-24	76.200	111.125	28.575	77.788	109.38	3.2	77000	209000	1700	2600	0.900
0-26	82.550	122.238	31.750	84.138	120.50	3.2	97500	252000	1600	2400	1.30
0-28	88.900	128.588	31.750	90.488	127.00	3.2	99000	266000	1500	2300	1.32
0-30	95.250	134.938	31.750	96.838	133.35	3.2	98500	289000	1500	2200	1.36
0-32	101.600	147.638	34.925	103.188	164.05	3.2	113000	310000	1300	2000	1.88
0-36	114.300	166.688	44.450	115.888	165.10	4.8	157000	435000	1100	1700	3.18
0-40	127.000	185.738	50.800	128.588	184.15	4.8	193000	545000	1000	1500	4.54
0-44	139.700	204.788	55.562	141.288	203.20	4.8	248000	715000	910	1300	5.90
0-48	152.400	220.662	60.325	153.988	219.075	4.8	269000	805000	830	1200	7.25

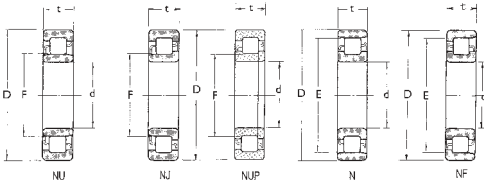
Series NU, NJ, NUP, N, NF



Cylindrical Roller Bearings

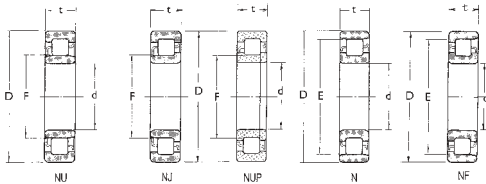
Bearing Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed (rev/min)		Weight kg
	d	D	t	F	E	Cr	Cor	Grease	Oil	
NU 204 NJ NUP N NF	20	47	14	27	40	1 5400	12700	15000	18000	0.110
NU 2204 NJ NUP – –	20	47	18	27	–	20700	18400	13000	16000	0.144
NU 304 NJ NUP N NF	20	52	15	28.5	44.5	21400	17300	12000	15000	0.150
NU 2304 NJ NUP – –	20	52	21	28.5	–	21400	27200	11000	14000	0.217
NU 1005 – – – –	25	47	12	30.5	–	14300	13100	15000	18000	0.094
NU 205 NJ NUP N NF	25	52	15	32	45	17700	15700	13000	16000	0.137
NU 2205 NJ NUP – –	25	52	18	32	–	23700	22800	12000	14000	0.167
NU 305 NJ NUP N NF	25	62	17	35	53	29300	25200	10000	13000	0.240
NU 2305 NJ NUP – –	25	62	24	35	–	42500	41000	9000	11000	0.345
NU 405 NJ – N NF	25	80	21	38.8	62.8	46500	40000	9000	11000	0.570
NU 1006 – – N –	30	55	13	36.5	48.5	19700	19600	12000	15000	0.136
NU 206 NJ NUP – –	30	62	16	38.5	–	23500	21500	11000	13000	0.211
NU 2206 NJ NUP – –	30	62	20	38.5	–	33000	33000	10000	12000	0.266
NU 306 NJ NUP N NF	30	72	19	42	62	38500	35000	8500	11000	0.361
NU 2306 NJ NUP – –	30	72	27	42	–	51500	51000	7500	9500	0.514
NU 406 NJ NUP N NF	30	90	23	45	73	62500	55000	7500	9500	0.757
NU 1007 – – N –	35	62	14	42	55	22600	23200	11000	13000	0.180
NU 207 NJ NUP – –	35	72	17	43.8	–	33500	31500	9500	11000	0.300
NU 2207 NJ NUP – –	35	72	23	43.8	–	49000	51000	8500	10000	0.414
NU 307 NJ NUP N NF	35	80	21	46.2	68.2	49500	47000	8000	9500	0.481
NU 2307 NJ NUP – –	35	80	31	46.2	–	60500	60000	7100	8500	0.702
NU 407 NJ NUP N NF	35	100	25	53	83	75500	69000	6700	8000	1.010
NU 1008 – – N –	40	68	15	47	61	27300	29000	10000	12000	0.223
NU 208 NJ NUP N NF	40	80	18	50	70	43500	43000	8500	10000	0.382
NU 2208 NJ NUP – –	40	80	23	50	–	58000	62000	7500	9000	0.496
NU 308 NJ NUP N NF	40	90	23	53.5	77.5	58500	57000	6700	8500	0.665
NU 2308 NJ NUP – –	40	90	33	53.5	–	82500	88000	6000	7500	0.962
NU 408 NJ NUP N NF	40	110	27	58	92	95500	89000	6000	7500	1.280
NU 1009 – – N –	45	75	16	52.5	67.5	32500	35500	9000	11000	0.279
NU 209 NJ NUP N NF	45	85	19	55	75	46000	47000	7500	9000	0.438
NU 2209 NJ NUP – –	45	85	23	55	–	61500	68000	7100	8500	0.541
NU 309 NJ NUP – –	45	100	25	58.5	–	74000	71000	6300	7500	0.876

Series NU, NJ, NUP, N, NF



Bearing Number						Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed (rev/min)		Weight kg
						d	D	t	F	E	Cr	Cor	Grease	Oil	
NU 2309	NJ	NUP	—	—	—	45	100	36	58.5	—	99000	104000	5600	6700	1.260
NU 409	NJ	NUP	N	NF	—	45	120	29	64.5	100.5	107000	102000	5600	6700	1.620
NU 1010	—	—	N	—	—	50	80	16	57.5	72.5	32000	36000	8000	10000	0.301
NU 210	NJ	NUP	N	NF	—	50	90	20	60.4	80.4	48000	51000	7100	8500	0.493
NU 2210	NJ	NUP	—	—	—	50	90	23	60.4	—	64000	73500	6300	8000	0.580
NU 310	NJ	NUP	N	NF	—	50	110	27	65	95	87000	86000	5600	6700	1.140
NU 2310	NJ	NUP	—	—	—	50	110	40	65	—	121000	131000	5000	6300	1.690
NU 410	NJ	NUP	—	—	—	50	130	31	70.8	—	129000	124000	5000	6000	1.990
NU 1011	—	—	N	—	—	55	90	18	64.5	80.5	37500	44000	7500	9000	0.445
NU 211	NJ	NUP	N	NF	—	55	100	21	66.5	88.5	58000	62500	6300	7500	0.648
NU 2211	NJ	NUP	—	—	—	55	100	25	66.5	—	75500	87000	6000	7100	0.786
NU 311	NJ	NUP	N	NF	—	55	120	29	70.5	104.5	111000	111000	5000	6300	1.450
NU 2311	NJ	NUP	—	—	—	55	120	43	70.5	—	148000	162000	4500	5600	2.160
NU 411	NJ	NUP	N	NF	—	55	140	33	77.2	117.2	139000	138000	4500	5600	2.500
NU 1012	—	—	N	—	—	60	95	18	69.5	85.5	40000	48500	6700	8500	0.474
NU 212	NJ	NUP	N	NF	—	60	110	22	73.5	97.5	68500	75000	6000	7100	0.840
NU 2212	NJ	NUP	—	—	—	60	110	28	73.5	—	96000	116000	5300	6300	1.090
NU 312	NJ	NUP	N	NF	—	60	130	31	77	113	124000	126000	4800	5600	1.820
NU 2312	NJ	NUP	—	—	—	60	130	46	77	—	169000	188000	4300	5300	2.690
NU 412	NJ	NUP	N	NF	—	60	150	35	83	127	167000	168000	4300	5300	3.040
NU 1013	—	—	N	—	—	65	100	18	74.5	90.5	41000	51000	6300	8000	0.504
NU 213	NJ	NUP	N	NF	—	65	120	23	79.6	105.6	84000	94500	5300	6300	1.070
NU 2213	NJ	NUP	—	—	—	65	120	31	79.6	—	120000	149000	4800	6000	1.470
NU 313	NJ	NUP	N	NF	—	65	140	33	83.5	121.5	135000	139000	4300	5300	2.230
NU 2313	NJ	NUP	—	—	—	65	140	48	83.5	—	188000	212000	3800	4800	3.250
NU 413	NJ	NUP	—	—	—	65	160	37	89.3	—	182000	186000	4000	4800	3.630
NU 1014	—	—	N	—	—	70	110	20	80	100	58500	70500	6000	7100	0.693
NU 214	NJ	NUP	N	NF	—	70	125	24	84.5	110.5	83500	95000	5000	6300	1.160
NU 2214	NJ	NUP	—	—	—	70	125	31	84.5	—	119000	151000	4500	5600	1.540
NU 314	NJ	NUP	—	—	—	70	150	35	90	—	158000	168000	4000	5000	2.750
NU 2314	NJ	NUP	—	—	—	70	150	51	90	—	223000	262000	3600	4500	4.040
NU 414	NJ	NUP	N	NF	—	70	180	42	100	152	228000	236000	3600	4300	5.280

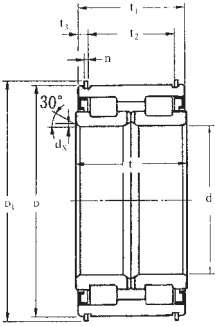
Series NU, NJ, NUP, N, NF



Cylindrical Roller Bearings

Bearing Number	Dimensions (mm)					Basic Load Ratings (N)		Limiting Speeds (rev/min)		Weight kg
	d	D	t	F	E	Cr	Cor	Grease	Oil	
NU 1015 - - N -	75	115	20	85	105	60000	74500	5600	6700	0.731
NU 215 NJ NUP N NF	75	130	25	88.5	116.5	96500	111000	4800	6000	1.250
NU 2215 NJ NUP - -	75	130	31	88.5	-	130000	162000	4300	5300	1.580
NU 315 NJ NUP N NF	75	160	37	95.5	139.5	179000	189000	3800	4800	3.260
NU 2315 NJ NUP - -	75	160	55	95.5	-	258000	300000	3400	4300	4.910
NU 415 NJ - N NF	75	190	45	104.5	160.5	262000	274000	3400	4000	6.270
NU 1016 - - N -	80	125	22	91.5	113.5	72500	90500	5300	6300	0.969
NU 216 NJ NUP N NF	80	140	26	95.3	125.3	106000	122000	4500	5300	1.500
NU 2216 NJ NUP - -	80	140	33	95.3	-	147000	186000	4000	5000	1.950
NU 316 NJ NUP N NF	80	170	39	103	147	190000	207000	3600	4300	3.930
NU 2316 NJ NUP - -	80	170	58	103	-	274000	330000	3200	4000	5.910
NU 416 NJ - N NF	80	200	48	110	170	299000	315000	3200	3800	7.360
NU 1017 - - N -	85	130	22	96.5	118.5	74500	95500	5000	6000	1.010
NU 217 NJ NUP N NF	85	150	28	101.8	133.8	120000	140000	4300	5000	1.900
NU 2217 NJ NUP - -	85	150	36	101.8	-	170000	218000	3800	4500	2.500
NU 317 NJ NUP N NF	85	180	41	108	156	212000	228000	3400	4000	4.600
NU 2317 NJ NUP - -	85	180	60	108	-	315000	380000	3000	3800	6.81
NU 417 NJ - N NF	85	210	52	113	177	335000	350000	3000	3800	9.56
NU 1018 - - N -	90	140	24	103	127	88000	114000	4500	5600	1.35
NU 218 NJ NUP N NF	90	160	30	107	143	152000	178000	4000	4800	2.35
NU 2218 NJ NUP - -	90	160	40	107	-	207000	265000	3600	4300	3.18
NU 318 NJ NUP N NF	90	190	43	115	165	240000	265000	3200	3800	5.38
NU 2318 NJ NUP - -	90	190	64	115	-	325000	395000	2800	3600	8.04
NU 418 NJ - N -	90	225	54	123.5	191.5	375000	400000	2800	3400	11.50
NU 1019 - - N -	95	145	24	108	132	90500	120000	4300	5300	1.41
NU 219 NJ NUP - -	95	170	32	113.5	-	158000	183000	3800	4500	2.80
NU 2219 NJ NUP - -	95	170	43	113.5	-	230000	298000	3400	4000	3.89
NU 319 NJ NUP N NF	95	200	45	121.5	173.5	259000	289000	3000	3600	6.23
NU 2319 NJ NUP - -	95	200	67	121.5	-	370000	460000	2600	3400	9.38
NU 419 NJ - - -	95	240	55	133.5	-	400000	445000	2600	3200	13.6
NU 1020 - - N -	100	150	24	113	137	93000	126000	4300	5300	1.47
NU 220 NJ NUP N NF	100	180	34	120	160	183000	217000	3600	4300	3.42
NU 2220 NJ NUP - -	100	180	46	120	-	246000	315000	3200	3800	4.68
NU 320 NJ NUP N NF	100	215	47	129.5	185.5	299000	335000	2800	3400	7.69
NU 2320 NJ NUP - -	100	215	73	129.5	-	410000	505000	2400	3200	11.90
NU 420 NJ - N NF	100	250	58	139	211	450000	500000	2600	3000	15.50

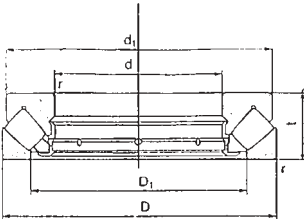
SL04-5000 Series



Bearing Number	Dimensions (mm)									Basic Load Ratings (N)		Limiting Speeds (rev/min)	Weight kg
	d	D	t	d_s	D_i	t_1	t_2	t_3	n	C_r	C_{or}		
SL04-5008NR	40	68	38	0.8	71.8	37	28	4.5	2.0	7400	7400	2500	0.55
SL04-5009NR	45	75	40	0.8	78.8	39	30	4.5	2.0	8850	9250	2200	0.69
SL04-5010NR	50	80	40	0.8	83.8	39	30	4.5	2.0	9300	10000	2000	0.75
SL04-5011NR	55	90	46	1.0	94.8	45	34	5.5	2.5	11000	12200	1800	1.12
SL04-5012NR	60	95	46	1.0	99.8	45	34	5.5	2.5	11400	13100	1650	1.20
SL04-5013NR	65	100	46	1.0	104.8	45	34	5.5	2.5	11900	14100	1550	1.27
SL04-5014NR	70	110	54	1.0	114.5	53	42	5.5	2.5	15900	18000	1400	1.87
SL04-5015NR	75	115	54	1.0	119.5	53	42	5.5	2.5	18200	20600	1300	1.97
SL04-5016NR	80	125	60	1.0	129.5	59	48	5.5	2.5	19000	22200	1250	2.66
SL04-5017NR	85	130	60	1.0	134.5	59	48	5.5	2.5	19800	23800	1200	2.79
SL04-5018NR	90	140	67	1.5	146.0	66	54	6.0	2.5	28300	34500	1100	3.71
SL04-5019NR	95	145	67	1.5	151.0	66	54	6.0	2.5	28900	35500	1050	3.87
SL04-5020NR	100	150	67	1.5	156.0	66	54	6.0	2.5	30500	37000	1000	4.03
SL04-5022NR	110	170	80	1.8	176.0	79	65	7.0	2.5	35500	44000	900	7.00
SL04-5024NR	120	180	80	1.8	188.0	79	65	7.0	3.0	37000	47500	850	7.50
SL04-5026NR	130	200	95	1.8	208.0	94	77	8.5	3.0	50000	63500	750	11.40
SL04-5028NR	140	210	95	1.8	218.0	94	77	8.5	3.0	55500	71000	700	12.10
SL04-5030NR	150	225	100	2.0	233.0	99	81	9.0	3.0	64000	81500	650	14.60

Spherical Roller Thrust Bearings

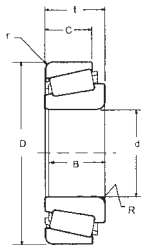
Series 29300



Bearing Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rev/min) Oil	Weight kg
	d	D	t	d_1	D_1	r (min)	Cr	Cor		
29317M	85	150	39	134.0	110.5	1.5	345000	1060000	3400	2.53
29318M	90	155	39	135.2	116.0	1.5	355000	1100000	3400	2.64
29320M	100	170	42	146.9	126.0	1.5	415000	1370000	3000	3.37
29322M	110	190	48	165.1	140.6	2.0	530000	1700000	2600	5.03
29324M	120	210	54	184.5	155.0	2.1	640000	2080000	2400	6.89
29326M	130	225	58	205.0	169.0	2.1	720000	2360000	2200	8.48
29328M	140	240	60	220.0	181.0	2.1	800000	2700000	2100	9.86
29330M	150	250	60	230.0	192.0	2.1	815000	2850000	2000	10.48

Series 29400

Bearing Number	Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rev/min) Oil	Weight kg
	d	D	t	d_1	D_1	r (min)	Cr	Cor		
29412M	60	130	42	113.0	87.0	1.5	283000	805000	2600	2.78
29413M	65	140	45	123.0	93.5	2.0	330000	945000	2400	3.44
29414M	70	150	48	128.3	98.4	2.0	365000	1040000	2200	4.19
29415M	75	160	51	140.0	105.6	2.0	415000	1190000	2100	5.07
29416M	80	170	54	149.0	113.0	2.1	460000	1380000	1900	6.09
29417M	85	180	58	158.2	120.5	2.1	490000	1480000	1800	7.20
29418M	90	190	60	162.0	127.0	2.1	545000	1680000	1700	8.38
29420M	100	210	67	181.0	139.0	3.0	685000	2130000	1500	11.50
29422M	110	230	73	199.6	153.4	3.0	845000	2620000	1400	15.00
9424M	120	250	78	218.0	166.5	4.0	975000	3050000	1350	18.60
29426M	130	270	85	236.4	181.0	4.0	1080000	3550000	1250	23.70
29428M	140	280	85	246.0	196.0	4.0	1110000	3750000	1200	25.20
29430M	150	300	90	270.0	211.0	4.0	1400000	4700000	1170	27.00



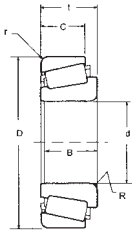
Tapered Roller Bearings

Series 30200

Metric

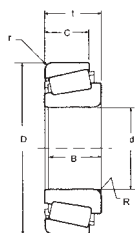
Bearing Number	Dimensions (mm)							Basic Load Ratings (N)		Weight kg
	d	D	t	B	C	r	R	Cr	Cor	
30203	17	40	13.25	12	11	1	1	19000	18600	0.08
30204	20	47	15.25	14	12	1	1	27500	28000	0.12
30205	25	52	16.25	15	13	1	1	30800	33500	0.15
30206	30	62	17.25	16	14	1	1	40200	44000	0.23
30207	35	72	18.25	17	15	1.5	1.5	51200	56000	0.32
30208	40	80	19.75	18	16	1.5	1.5	61600	68000	0.42
30209	45	85	20.75	19	16	1.5	1.5	66000	76500	0.48
30210	50	90	21.75	20	17	1.5	1.5	76500	91500	0.54
30211	55	100	22.75	21	18	1.5	2.0	89700	106000	0.70
30212	60	110	23.75	22	19	1.5	2.0	99000	114000	0.88
30213	65	120	24.75	23	20	1.5	2.0	114000	134000	1.15
30214	70	125	26.25	24	21	1.5	2.0	125000	156000	1.25
30215	75	130	27.25	25	22	1.5	2.0	140000	176000	1.40
30216	80	140	28.25	26	22	2.0	2.5	157000	183000	1.60
30217	85	150	30.50	28	24	2.5	2.0	184000	233000	2.12
30218	90	160	32.50	30	26	2.5	2.0	201000	256000	2.60
30219	95	170	34.50	32	27	3.0	2.5	223000	286000	3.13
30220	100	180	37.00	34	29	3.0	2.5	255000	330000	3.78
30221	105	190	39.00	36	30	3.0	2.5	280000	365000	4.51
30222	110	200	41.00	38	32	3.0	2.5	315000	420000	5.28
30224	120	215	43.50	40	34	3.0	2.5	335000	450000	6.28
30226	130	230	43.75	40	34	4.0	3.0	375000	505000	7.25
30228	140	250	45.75	42	36	4.0	3.0	390000	515000	8.74

Series 30300



Tapered Roller Bearings

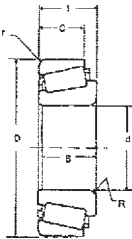
Bearing Number	Dimensions (mm)							Basic Load Ratings (N)		Weight kg
	d	D	t	B	C	r	R	Cr	Cor	
30302	15	42	14.25	13	11	1.0	1.0	22400	20000	0.095
30303	17	47	15.25	14	12	1.0	1.0	28100	25000	0.130
30304	20	52	16.25	15	13	1.5	1.5	34100	32500	0.170
30305	25	62	18.25	17	15	1.5	1.5	44600	43000	0.260
30306	30	72	20.75	19	16	1.5	1.5	56100	56000	0.390
30307	35	80	22.75	21	18	1.5	2.0	72100	73500	0.520
30308	40	90	25.25	23	20	1.5	2.0	85800	95000	0.720
30309	45	100	27.25	25	22	1.5	2.0	108000	120000	0.970
30310	50	110	29.25	27	23	2.0	2.5	125000	140000	1.250
30311	55	120	31.50	29	25	2.0	2.5	142000	163000	1.550
30312	60	130	33.50	31	26	2.5	3.0	168000	196000	1.950
30313	65	140	36.00	33	28	2.5	3.0	203000	238000	2.55
30314	70	150	38.00	35	30	2.5	3.0	230000	272000	3.06
30315	75	160	40.00	37	31	2.5	3.0	255000	305000	3.57
30316	80	170	42.50	39	33	2.5	3.0	291000	350000	4.41
30317	85	180	44.50	41	34	3.0	4.0	305000	365000	5.20
30318	90	190	46.50	43	36	3.0	4.0	335000	405000	6.03
30319	95	200	49.50	45	38	3.0	4.0	365000	445000	6.98
30320	100	215	51.50	47	39	3.0	4.0	410000	500000	8.56



Series 30300D

Bearing Number	Dimensions (mm)							Basic Load Ratings (N)		Weight (kg)
	d	D	t	B	C	r	R	Cr	Cor	
30303D	17	47	15.25	14	10.5	1.0	1.0	28100	25000	0.130
30304D	20	52	16.25	15	11.5	1.5	1.5	34100	32500	0.170
30305D	25	62	18.25	17	13	1.5	1.5	39800	42500	0.256
30306D	30	72	20.75	19	14	1.5	1.5	41500	49000	0.378
30307D	35	80	22.75	21	15	1.5	2.0	62000	68000	0.490
30308D	40	90	25.25	23	17	1.5	2.0	80000	90200	0.700
30309D	45	100	27.25	25	18	1.5	2.0	95000	10700	0.950
30310D	50	110	29.25	27	19	2.0	2.5	115000	133000	1.230
30311D	55	120	31.50	29	21	2.0	2.5	129000	148000	1.530
30312D	60	130	33.50	31	22	2.5	3.0	153000	179000	1.930
30313D	65	140	36.00	33	23	2.5	3.0	176000	209000	2.530
30314D	70	150	38.00	35	25	2.5	3.0	197000	235000	3.000
30315D	75	160	40.00	37	26	2.5	3.0	222000	266000	3.500
30316D	80	170	42.50	39	27	2.5	3.0	236000	282000	4.120
30317D	85	180	44.50	41	28	3.0	4.0	263000	317000	4.540
30318D	90	190	46.50	43	30	3.0	4.0	282000	336000	5.600
30319D	95	200	49.50	45	32	3.0	4.0	310000	375000	6.680
30320D	100	215	51.50	47	34	3.0	4.0	318000	391000	8.020

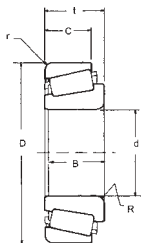
Series 31300 &
Series 32000



Bearing Number	Dimensions (mm)							Basic Load Ratings (N)		Weight kg
	d	D	t	B	C	r	R	Cr	Cor	
31305	25	62	18.25	17	13.0	1.5	1.5	38000	40000	0.25
31306	30	72	20.72	19	14.0	1.5	1.5	47300	50000	0.39
31307	35	80	22.75	21	15.0	1.5	2.0	61600	67000	0.52
31308	40	90	25.25	23	17.0	1.5	2.0	73700	81500	0.72
31309	45	100	27.25	25	18.0	1.5	2.0	91300	102000	0.95
31310	50	110	29.25	27	19.0	2.0	2.5	106000	120000	1.20
31311	55	120	31.50	29	21.0	2.0	2.5	121000	137000	1.55

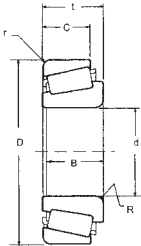
32005	25	47	15.00	15	11.5	0.8	0.8	27000	32500	0.11
32006	30	55	17.00	17	13.0	1.0	1.0	35800	44000	0.17
32007	35	62	18.00	18	14.0	1.0	1.0	42900	54000	0.22
32008	40	68	19.00	18	14.5	1.0	1.0	52800	7100	0.27
32009	45	75	20.00	20	15.5	1.0	1.0	58300	80000	0.34
32010	50	80	20.00	20	15.5	1.0	1.0	60500	68000	0.37
32011	55	90	23.00	23	17.5	1.5	1.5	80500	118000	0.583
32012	60	95	23.00	23	17.5	1.5	1.5	82000	123000	0.576
32013	65	100	23.00	23	17.5	1.5	1.5	83000	128000	0.63
32014	70	110	25.00	25	19.0	1.5	1.5	105000	160000	0.848
32015	75	115	25.00	25	19.0	1.5	1.5	108000	167000	0.909
32016	80	125	29.00	29	22.0	1.5	1.5	139000	218000	1.28
32017	85	130	29.00	29	22.0	1.5	1.5	142000	224000	1.35
32018	90	140	32.00	32	24.0	1.5	1.5	168000	270000	1.78
32019	95	145	32.00	32	24.0	1.5	2.0	171000	280000	1.83
32020	100	150	32.00	32	24.0	1.5	2.0	170000	281000	1.91
32021	105	160	35.00	35	26.0	1.5	2.0	201000	336000	2.42
32022	110	170	38.00	38	29.0	2.0	2.5	236000	390000	3.07
32024	120	180	38.00	38	29.0	2.0	2.5	245000	420000	3.25
32026	130	200	45.00	42	36.0	2.0	2.5	269000	445000	4.67
32028	140	210	45.0	42	36.0	2.0	2.5	278000	470000	4.95

* For Tapered bore bearings add Suffix 'K'



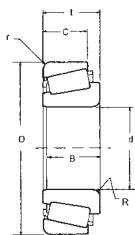
Bearing Number	Dimensions (mm)							Basic Load Ratings (N)		Weight kg
	d	D	t	B	C	r	R	Cr	Cor	
32204	20	47	19.25	18	15	1.0	1.0	28200	29000	0.16
32205	25	52	19.25	18	15	1.0	1.0	35800	44000	0.19
32206	30	62	21.25	20	17	1.0	1.0	50100	57000	0.28
32207	35	72	24.25	23	19	1.5	1.5	66000	78000	0.43
32208	40	80	24.75	23	19	1.5	1.5	74800	86500	0.53
32209	45	85	24.75	23	19	1.5	1.5	80900	98000	0.58
32210	50	90	24.75	23	19	1.5	1.5	825000	100000	0.61
32211	55	100	25.75	25	21	1.5	2.0	106000	129000	0.83
32212	60	110	29.75	28	24	1.5	2.0	125000	160000	1.15
32213	65	120	32.75	31	27	1.5	2.0	151000	193000	1.50
32214	70	125	33.25	31	27	1.5	2.0	157000	208000	1.60
32215	75	130	33.25	31	27	1.5	2.0	161000	212000	1.70
32216	80	140	35.25	33	28	2.0	2.5	187000	245000	2.05
32217	85	150	38.50	36	30	2.0	2.5	224000	300000	2.75
32218	90	16	42.50	40	34	2.0	2.5	262000	360000	3.49
32219	95	170	45.50	43	37	3.0	2.5	299000	415000	4.3
32220	100	180	49.00	46	39	3.0	2.5	330000	465000	5.12
32221	105	190	53.00	50	43	3.0	2.5	360000	510000	6.25
32222	110	200	56.00	53	46	3.0	2.5	400000	565000	7.35
32224	120	215	61.50	58	50	3.0	2.5	440000	635000	9.00
32226	130	230	67.75	64	54	4.0	3.0	530000	790000	11.30
32228	140	250	71.75	68	58	4.0	3.0	610000	915000	14.30

Series 32300



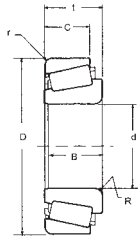
Tapered Roller Bearings

Bearing Number	Dimensions (mm)							Basic Load Ratings (N)		Weight kg
	d	D	t	B	C	r	R	Cr	Cor	
32303	17	47	20.25	19	16	1	1	34700	33500	0.17
32304	20	52	22.25	21	18	1.5	1.5	44000	45500	0.23
32305	25	62	25.25	24	20	1.5	1.5	60500	63000	0.36
32306	30	72	28.75	27	23	1.5	1.5	76500	85000	0.55
32307	35	80	32.75	31	25	1.5	2.0	93500	114000	0.80
32308	40	90	35.25	33	27	1.5	2.0	108000	140000	1.10
32309	45	100	38.25	36	30	1.5	2.0	134000	176000	1.45
32310	50	110	42.25	40	33	2.0	2.5	161000	216000	1.85
32311	55	120	45.50	43	35	2.0	2.5	19000	260000	2.50
32312	60	130	48.50	46	37	2.5	3.0	220000	305000	2.80
32313	65	140	51	48	39	2.5	3.0	275000	356000	3.64
32314	70	150	54	51	42	2.5	3.0	310000	405000	4.46
32315	75	160	58	55	45	2.5	3.0	355000	470000	5.35
32316	80	170	61.5	58	48	2.5	3.0	395000	525000	6.41
32317	85	180	63.5	60	49	3.0	4.0	405000	525000	7.15
32318	90	190	67.5	64	53	3.0	4.0	450000	595000	8.57
32319	95	200	71.5	67	55	3.0	4.0	505000	670000	10.1
32320	100	215	77.5	73	60	3.0	4.0	570000	777000	12.7



Bearing Number	Dimensions (mm)							Basic Load Ratings (N)		Weight kg
	d	D	t	B	C	r	R	Cr	Cor	
33009	45	75	24	24	19	1	1	72000	104000	0.432
33010	50	80	24	24	19	1	1	75000	114000	0.470
33011	55	90	27	27	21	1.5	1.5	93000	143000	0.673
33012	60	95	27	27	21	1.5	1.5	96500	150000	0.73
33013	65	100	27	27	21	1.5	1.5	100000	163000	0.84
33014	70	110	31	31	25.5	1.5	1.5	137000	224000	1.14
33015	75	115	31	31	25.5	1.5	1.5	140000	232000	1.12
33016	80	125	36	36	29.5	1.5	1.5	176000	290000	1.67
33017	85	130	36	36	29.5	1.5	1.5	183000	315000	1.73
33018	90	140	39	39	32.5	2	1.5	216000	365000	2.48
33019	95	145	39	39	32.5	2	1.5	220000	380000	2.33
33020	100	150	39	39	32.5	2	1.5	224000	400000	2.42
33021	105	160	43	43	34	2.5	2	265000	450000	3.34
33022	110	170	47	47	37	2.5	2	300000	520000	4.16
33024	120	180	48	48	38	2.5	2	310000	560000	4.55

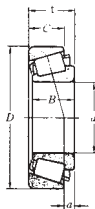
Series 33100 &
Series 33200



Tapered Roller Bearings

Bearing Number	Dimensions (mm)							Basic Load Ratings (N)		Weight kg
	d	D	t	B	C	r	R	Cr	Cor	
33108	40	75	26	26	20.5	1.5	1.5	79500	103000	0.494
33109	45	80	26	26	20.5	1.5	1.5	84500	115000	0.495
33110	50	85	26	26	20.0	1.5	1.5	86500	121000	0.58
33111	55	95	30	30	23.0	1.5	1.5	111000	155000	0.846
33112	60	100	30	30	23.0	1.5	1.5	113000	164000	0.912
33113	65	110	34	34	26.5	1.5	1.5	144000	211000	1.28
33114	70	120	37	37	29.0	1.5	2.0	176000	260000	1.73
33115	75	125	37	37	29.0	1.5	2.0	180000	275000	1.82
33116	80	130	37	37	29.0	1.5	2.0	190000	300000	1.93
33117	85	140	41	41	32.0	1.5	2.5	220000	355000	2.5
33118	90	150	45	45	35.0	1.5	2.5	265000	425000	3.22

33205	25	52	22	22	18.0	2.0	1.0	47500	57500	0.217
33206	30	62	25	25	19.5	2.0	1.0	65000	77000	0.344
33207	35	72	28	28	22.0	1.5	1.5	87500	109000	0.531
33208	40	80	32	32	25.0	1.5	1.5	103000	132000	0.728
33209	45	85	32	32	25.0	1.5	1.5	107000	141000	0.783
33210	50	90	32	32	24.5	1.5	1.5	115000	158000	0.852
33211	55	100	35	35	27.0	1.5	2.0	138000	188000	1.15
33212	60	110	38	38	29.0	1.5	2.0	167000	234000	1.55
33213	65	120	41	41	32.0	1.5	2.0	195000	265000	1.98
33214	70	125	41	41	32.0	1.5	2.0	201000	282000	2.1
33215	75	130	41	41	31.0	1.5	2.0	208000	298000	2.2
33216	80	140	46	46	35.0	2.0	2.5	250000	365000	2.92
33217	85	150	49	49	37.0	2.0	2.5	284000	420000	3.58



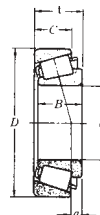
Single Row Inch Series0.500

d 12.700~22.606mm

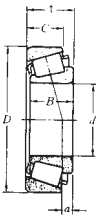
0.5000~0.8900inch

Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
A4050/ A4138	12.700 0.5000	34.988 1.3775	10.998 0.4330	10.988 0.4326	8.730 0.3437	12300 2770	11600 2600	12000	16000	0.053 0.117
LM67045/10	13.750	59.131	15.875	18.570	18.811					
A4059/ A4138	14.989 0.5901	34.988 1.3775	10.998 0.4330	10.988 0.4326	8.730 0.3437	12300 2770	11600 2600	12000	16000	0.049 0.108
03062/ 03162	15.875 0.6250	41.275 1.6250	14.288 0.5625	14.681 0.5780	11.112 0.4375	20300 4550	18700 4200	10000	13000	0.092 0.203
11590/ 11520	15.875 0.6250	42.862 1.6875	14.288 0.5625	14.288 0.5625	9.525 0.3750	17600 3950	17500 3950	8700	12000	0.103 0.227
17580/ 17520	15.875 0.6250	42.862 1.6875	16.670 0.6563	16.670 0.6563	13.495 0.5313	26700 6000	26000 5850	9800	13000	0.122 0.269
05062/ 05185	15.875 0.6250	47.000 1.8504	14.381 0.5662	14.381 0.5662	11.112 0.4375	24000 5400	24200 5450	8600	11000	0.131 0.289
09062/ 09195	15.875 0.6250	49.225 1.9380	19.845 0.7813	21.539 0.8480	14.288 0.5625	38500 8600	39000 8700	8500	11000	0.203 0.448
05066/ 05185	16.993 0.6690	47.000 1.8504	14.381 0.5662	14.381 0.5662	11.112 0.4375	24000 5400	24200 5450	8600	11000	0.127 0.280
LM11749/ LM11710	17.462 0.6875	39.878 1.5700	13.843 0.5450	14.605 0.5750	10.688 0.4200	23800 5350	24200 5450	10000	13000	0.084 0.185
A6075/ A6157	19.050 0.7500	39.992 1.5745	12.014 0.4730	11.153 0.4391	9.525 0.3750	12800 2880	12800 2870	10000	13000	0.065 0.143
LM11949/ LM11910	19.050 0.7500	45.237 1.7810	15.494 0.6100	16.637 0.6550	12.065 0.4750	28300 6350	28600 6450	8900	12000	0.122 0.269
05075/ 05185	19.050 0.7500	47.000 1.8504	14.381 0.5662	14.381 0.5662	11.112 0.4375	24000 5400	24200 5450	8600	11000	0.121 0.267
09067/ 09195	19.050 0.7500	49.225 1.9380	18.034 0.7100	19.050 0.7500	14.288 0.5625	38500 8600	39000 8700	8500	11000	0.179 0.395
09074/ 09195	19.050 0.7500	49.225 1.9380	19.845 0.7813	21.539 0.8480	14.288 0.5625	38500 8600	39000 8700	8500	11000	0.188 0.414
09078/ 09195	19.050 0.7500	49.225 1.9380	19.845 0.7813	21.539 0.8480	14.288 0.5625	38500 8600	39000 8700	8500	11000	0.188 0.414
09067/ 09194	19.050 0.7500	49.225 1.9380	21.209 0.8350	19.050 0.7500	17.462 0.6875	38500 8600	39000 8700	8500	11000	0.195 0.430
09067/ 09196	19.050 0.7500	49.225 1.9380	21.209 0.8350	19.050 0.7500	17.462 0.6875	38500 8600	39000 8700	8500	11000	0.198 0.437
21075/ 21212	19.050 0.7500	53.975 2.1250	22.225 0.8750	21.839 0.8598	15.875 0.6250	40000 9050	39000 8700	8000	11000	0.248 0.547
1775/ 1729	19.050 0.7500	56.896 2.2400	19.368 0.7625	19.837 0.7810	15.875 0.6250	42500 9600	46500 10400	7200	9600	0.272 0.600
05079/ 05185	19.987 0.7869	47.000 1.8504	14.381 0.5662	14.381 0.5662	11.112 0.4375	24000 5400	24200 5450	8600	11000	0.117 0.258
07079/ 07196	20.000 0.7874	50.005 1.9687	13.495 0.5313	14.260 0.5614	9.525 0.3750	26000 5850	27900 6300	7500	10000	0.138 0.304
09081/ 09195	20.625 0.8120	49.225 1.9380	19.845 0.7813	21.539 0.8480	14.288 0.5625	38500 8600	39000 8700	8500	11000	0.179 0.395
12580/ 12520	20.638 0.8125	49.225 1.9380	19.845 0.7813	19.845 0.7813	15.875 0.6250	37500 8400	39000 8750	8200	11000	0.182 0.401
M12649/ M12610	21.430 0.8437	50.005 1.9687	17.526 0.6900	18.288 0.7200	13.970 0.5500	38000 8500	39000 8750	8000	11000	0.169 0.373
LM127749/ LM12711	21.986 0.8656	45.974 1.8100	15.494 0.6100	16.637 0.6550	12.065 0.4750	29600 6650	34000 7600	8400	11000	0.123
07087/ 07196	22.225 0.8750	50.005 1.9687	13.495 0.5313	14.260 0.5614	9.525 0.3750	26000 5850	27900 6300	7500	10000	0.130 0.287
M12648/ M12610	22.225 0.8750	50.005 1.9687	17.526 0.6900	18.288 0.7200	13.970 0.5500	38000 8500	39000 8750	8000	11000	0.165 0.364
1380/ 1328	22.225 0.8750	52.388 2.0625	19.368 0.7625	20.168 0.7940	14.288 0.5625	40500 9150	43000 9600	7600	10000	0.200 0.441
1380/ 1329	22.225 0.8750	53.975 2.1250	19.368 0.7625	20.168 0.7940	14.288 0.5625	40500 9150	43000 9600	7600	10000	0.215 0.474
1755/ 1729	22.225 0.8750	56.896 2.2400	19.368 0.7625	19.837 0.7810	15.875 0.6250	42500 9600	46500 10400	7200	9600	0.256 0.564
1280/ 1220	22.225 0.8750	57.150 2.2500	22.225 0.8750	22.225 0.8750	17.462 0.6875	47000 10600	49500 11100	7100	9500	0.286 0.631
LM72849/ LM72810	22.606 0.8900	47.000 1.8504	15.500 0.6102	15.500 0.6102	12.000 0.4724	27500 6150	32500 7300	8200	11000	0.125 0.276

Single Row Inch Series d 23.812~28.575mm 0.9375~1.125inch



Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
07093/ 07196	23.812 0.9375	50.005 1.9687	13.495 0.5313	14.260 0.5614	9.525 0.3750	26000 5850	27900 6300	7500	10000	0.123 0.271
L44640/ L44610	23.812 0.9375	50.292 1.9800	14.224 0.5600	14.732 0.5800	10.668 0.4200	28800 6500	34000 7600	7400	9900	0.137 0.302
1779/ 1729	23.812 0.9375	56.896 2.2400	19.368 0.7625	19.837 0.7810	15.875 0.6250	42500 9600	46500 10400	7200	9600	0.247 0.545
07098/ 07196	24.981 0.9835	50.005 1.9687	13.495 0.5313	14.260 0.5614	9.525 0.3750	26000 5850	27900 6300	7500	10000	0.118 0.260
07097/ 07196	25.000 0.9843	50.005 1.9687	13.495 0.5313	14.260 0.5614	9.525 0.3750	26000 5850	27900 6300	7500	10000	0.118 0.260
07096/ 07196	25.159 0.9905	50.005 1.9687	13.495 0.5313	14.260 0.5614	9.525 0.3750	26000 5850	27900 6300	7500	10000	0.1117 0.258
07100 07196	25.400 1.0000	50.005 1.9687	13.495 0.5313	14.260 0.5614	9.525 0.3750	26000 5850	27900 6300	7500	10000	0.1117 0.258
07100S/ 07196	25.400 1.0000	50.005 1.9687	13.495 0.5313	14.260 0.5614	9.525 0.3750	26000 5850	27900 6300	7500	1000	0.116 0.258
L44643/ L44610	25.400 1.0000	50.292 1.9800	14.224 0.5600	14.732 0.5800	10.688 0.4200	28800 6500	34000 7600	7400	9900	0.130 0.287
07100/ 07204	25.400 1.0000	51.994 2.0470	15.011 0.5910	14.260 0.5614	12.700 0.5000	26000 5850	27900 6300	7500	10000	0.3144 0.317
1780/ 1729	25.400 1.0000	56.896 2.2400	19.368 0.7625	19.837 0.7810	15.875 0.6250	42500 9600	46500 10400	7200	9600	0.238 0.525
M84548/ M84510	25.400 1.0000	57.150 2.2500	19.431 0.7650	19.431 0.7650	14.732 0.5800	42000 9500	48500 11000	6900	9200	0.241 0.531
M84249 M84210	25.400 1.0000	59.530 2.3437	23.368 0.9200	23.114 0.9100	18.288 0.7200	50000 11200	57500 13000	6800	9100	0.324 0.714
15578/ 15523	25.400 1.0000	60.325 2.3750	19.842 0.7812	17.462 0.6875	15.875 0.6250	39500 8900	45500 10200	6700	8900	0.271 0.597
15101/ 15243	25.400 1.0000	61.912 2.4375	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.300 0.661
15100/ 15245	25.400 1.0000	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.299 0.659
15101/ 15245	25.400 1.0000	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.301 0.664
15102 15245	25.400 1.0000	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.301 0.664
15101/ 15244	25.400 1.0000	62.000 2.4409	20.638 0.8125	20.638 0.8125	15.875 0.6250	46500 10500	54000 12200	6100	8200	0.315 0.694
15101 15250	25.400 1.0000	63.500 2.5000	20.638 0.8125	20.638 0.8125	15.875 0.6250	46500 10500	54000 12200	6100	8200	0.333 0.734
15101/ 15250X	25.400 1.0000	63.500 2.5000	20.638 0.8125	20.638 0.8125	15.875 0.6250	46500 10500	54000 12200	6100	8200	0.333 0.734
M86643/ M86610	25.400 1.0000	64.292 2.5312	21.433 0.8438	21.433 0.8438	16.670 0.6563	51500 11600	64500 14600	6100	8100	0.371 0.818
23100 23256	25.400 1.0000	65.088 2.5625	22.225 0.8750	21.463 0.8450	15.875 0.6250	47000 10600	50500 11400	5700	7600	0.360 0.794
2687/ 2631	25.400 1.0000	66.421 2.6150	23.812 0.9375	25.433 1.0013	19.050 0.7500	64500 14400	72500 16300	6200	8200	0.442 0.974
15103 15245	26.157 1.0298	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.296 0.653
2682/ 2631	26.162 1.0300	66.421 2.6150	23.812 0.9375	25.433 1.0013	19.050 0.7500	64500 14400	72500 16300	6200	8200	0.436 0.961
L44649/ L44610	26.988 1.0625	50.292 1.9800	14.224 0.5600	14.732 0.5800	10.668 0.4200	28800 6500	34000 79600	7400	9900	0.120 0.265
15580/ 15523	26.988 1.0625	60.325 2.3750	19.842 0.7812	17.462 0.6875	15.875 0.6250	39500 8900	45500 10200	6700	8900	0.260 0.573
15106/ 15245	26.988 1.0625	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.291 0.642
2688/ 2631	26.988 1.0625	66.421 2.6150	23.812 0.9375	25.433 1.0013	19.050 0.7500	64500 14400	72500 16300	6200	8200	0.429 0.946
1985/ 1930	28.575 1.1250	56.896 2.2400	19.845 0.7813	19.355 0.7620	15.875 0.6250	40500 9150	4450 10000	6700	8900	0.217 0.478
15590 15520	28.575 1.1250	57.150 2.2500	17.462 0.6875	17.462 0.6875	13.495 0.5313	39500 8900	45500 10200	6700	8900	0.196 0.432
1985/ 1932	28.575 1.1250	58.738 2.3125	19.050 0.7500	19.355 0.7620	15.080 0.5937	40500 9150	44500 10000	6700	8900	0.230 0.507
1988/ 1932	28.575 1.1250	58.738 2.3125	19.050 0.7500	19.355 0.7620	15.080 0.5937	40500 9150	44500 10000	6700	8900	0.228 0.503



Single Row Inch Series

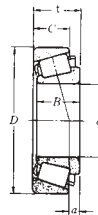
d 28.575~31.750mm

1.1250~1.2500inch

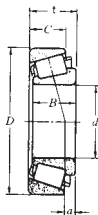
Tapered Roller Bearings

Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
15590/ 15523	28.575 1.1250	60.325 2.3750	19.842 0.7812	17.462 0.6875	15.875 0.6250	39500 8900	45500 10200	6700	8900	0.250 0.551
1985/ 1931	28.575 1.1250	60.235 2.3750	19.845 0.7813	19.355 0.7620	15.875 0.6250	40500 9150	44500 10000	6700	8900	0.255 0.562
15112/ 15245	28.575 1.1250	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.277 0.611
15113/ 15245	28.575 1.1250	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.280 0.617
M86647/ M86610	28.575 1.1250	64.292 2.5312	21.433 0.8438	21.433 0.8438	16.670 0.6563	51500 11600	64500 14600	6100	8100	0.348 0.747
2689/ 2631	28.575 1.1250	66.421 2.6150	23.812 0.9375	25.433 1.0013	19.050 0.7500	64500 14400	72500 16300	6200	8200	0.416 0.917
02471/ 02420	28.575 1.1250	68.262 2.6875	22.225 0.8750	22.225 0.8750	17.462 0.6875	57000 12800	67000 15100	5800	7700	0.409 0.902
2474/ 2420	28.575 1.1250	68.262 2.6875	22.225 0.8750	23.812 0.9375	17.462 0.6875	57500 12900	65500 14800	5700	7700	0.410 0.904
2578/ 2523	28.575 1.1250	69.850 2.7500	23.812 0.9375	25.357 0.9983	19.050 0.7500	69000 15500	81500 18300	5700	7600	0.483 1.07
41125/ 41286	28.575 1.1250	72.626 2.8593	24.608 0.9688	24.257 0.9550	17.462 0.6875	58000 13100	55500 12500	5800	7700	0.477 1.05
41126/ 41286	28.575 1.1250	72.626 2.8593	24.608 0.9688	24.257 0.9550	17.462 0.6875	58000 13100	55500 12500	5800	7700	0.481 1.06
02872/ 02820	28.575 1.1250	73.025 2.8750	22.225 0.8750	22.225 0.8750	17.462 0.6875	56500 12700	68000 15300	5300	7000	0.480 1.06
L45449/ L45410	29.000 1.1417	50.292 1.9800	14.224 0.5600	14.732 0.5800	10.668 0.4200	28000 6300	35500 8000	7200	9600	0.113 0.249
2690/ 2631	29.367 1.1562	66.421 2.6150	23.812 0.9375	25.433 1.0013	19.050 0.7500	64500 14400	72500 16300	6200	8200	0.406 0.895
17118/ 17244	29.987 1.1806	62.000 2.4409	16.002 0.6300	16.566 0.6522	14.288 0.5625	39000 8750	42000 9500	6300	8400	0.228 0.503
15117/ 15245	29.987 1.1806	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.269 0.593
14117A/ 14276	30.000 1.1811	69.012 2.7170	19.845 0.7813	19.583 0.7710	15.875 0.6250	48500 10800	58000 13000	5600	7400	0.369 0.813
JHM88540/ JHM88513	30.000 1.1811	72.000 2.8346	29.370 1.1563	27.783 1.0938	23.020 0.9063	72000 16200	97000 21800	5400	7100	0.619 1.37
15116/ 15245	30.112 1.1855	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.268 0.591
17119/ 17244	30.162 1.1875	62.000 2.4409	16.002 0.6300	16.566 0.6522	14.288 0.5625	39000 8750	42000 9500	6300	8400	0.226 0.498
M86649/ M86610	30.162 1.1875	64.292 2.5312	21.433 0.8438	21.433 0.8438	16.670 0.6563	51500 11600	64500 14600	6100	8100	0.336 0.741
2558/ 2523	30.162 1.1875	69.850 2.7500	23.812 0.9375	25.357 0.9938	19.050 0.7500	69000 15500	81500 18300	5700	7600	0.468 1.03
3187/ 3120	30.162 1.1875	72.626 2.8593	30.162 1.1875	29.997 1.1810	23.812 0.9375	84500 19000	98000 22000	5500	7300	0.621 1.37
15118/ 15245	30.213 1.1895	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.265 0.584
15119/ 15245	30.213 1.1895	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.267 0.589
15120/ 15245	30.213 1.1895	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.267 0.589
14116/ 14274	30.226 1.1900	69.012 2.7170	19.845 0.7813	19.583 0.7710	15.875 0.6250	48500 10800	58000 13000	5600	7400	0.366 0.807
14116/ 14276	30.226 1.1900	69.012 2.7170	19.845 0.7813	19.583 0.7710	15.875 0.62500	48500 10800	58000 13000	5600	7400	0.370 0.816
14116/ 14283	30.226 1.1900	72.085 2.8380	22.385 0.8813	19.583 0.7710	18.415 0.7250	48500 10800	58000 13000	5600	7400	0.447 0.985
LM67048/ LM67010	31.750 1.1250	59.131 2.3280	15.875 0.6250	16.764 0.6600	11.811 0.4650	38500 7750	41000 9200	6300	8400	0.182 0.401
15123/ 15245	31.750 1.1250	62.000 2.4409	18.161 0.7150	19.050 0.7500	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.244 0.538
15125/ 15245	31.750 1.1250	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.253 0.558
15126/ 15245	31.750 1.1250	62.000 2.4409	19.050 0.7500	20.638 0.8125	14.288 0.5625	46500 10500	54000 12200	6100	8200	0.255 0.562

Single Row Inch Series d 31.750mm~34.925mm 1.2500~1.375 inch



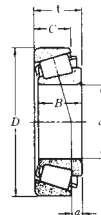
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
2580	31.750	66.421	25.400	25.357	20.638	69000	81500	5700	7600	0.409
2520	1.2500	2.6150	1.0000	0.9983	0.8125	15500	18300			0.902
02475/ 02420	31.750	68.262	22.225	22.552	17.462	57000	67000	5800	7700	0.380
	1.2500	2.6875	0.8750	0.8750	0.6875	12800	15100			0.838
02476/ 02420	31.750	68.262	22.225	22.225	17.462	57000	67000	5800	7700	0.383
	1.2500	2.6875	0.8750	0.8750	0.6875	12800	15100			0.844
14124/ 14276	31.750	69.012	19.845	19.583	15.875	48500	58000	5600	7400	0.359
	1.2500	2.7170	0.7813	0.7710	0.6250	10800	13000			0.791
14125A/ 14276	31.750	69.012	19.845	19.583	15.875	48500	58000	5600	7400	0.356
	1.2500	2.7170	0.7813	0.7710	0.6250	10800	13000			0.785
2580/ 2523	31.750	69.850	23.812	25.357	19.050	69000	81500	5700	7600	0.454
	1.2500	2.7500	0.9375	0.9983	0.7500	15500	18300			1.00
2580/ 2523S	31.750	69.850	23.812	25.357	19.050	69000	81500	5700	7600	0.453
	1.2500	2.7500	0.9375	0.9983	0.7500	15500	18300			0.999
2582/ 2523	31.750	69.850	23.812	25.357	19.050	69000	81500	5700	7600	0.451
	1.2500	2.7500	0.9375	0.9983	0.7500	15500	18300			0.994
3188/ 3120	31.750	72.626	30.162	29.997	23.812	84500	98000	5500	7300	0.603
	1.2500	2.8593	1.1875	1.1810	0.9375	19000	22000			1.33
3193/ 3120	31.750	72.626	30.162	29.997	23.812	84500	98000	5500	7300	0.601
	1.2500	2.8593	1.1875	1.1810	0.9375	19000	22000			1.33
02875/ 02820	31.750	73.025	22.225	22.225	17.462	56500	68000	5300	7000	0.451
	1.2500	2.8750	0.8750	0.8750	0.6875	12700	15300			0.994
02879/ 02820	31.750	73.025	22.225	23.812	17.462	62500	75500	5200	7000	0.465
	1.2500	2.8750	0.8750	0.9375	0.6875	14100	17000			1.03
HM88542/ HM88510	31.750	73.025	29.370	27.783	23.020	72000	97000	5400	7100	0.622
	1.2500	2.8750	1.1563	1.0938	0.9063	16200	21800			1.37
HM88542/ HM88512	31.750	73.025	29.370	27.783	23.020	72000	97000	5400	7100	0.638
	1.2500	2.9060	1.1563	1.0938	0.9063	16200	21800			1.41
HM89440/ HM89410	31.750	76.200	29.370	28.575	23.020	78000	105000	5100	6800	0.686
	1.2500	3.0000	1.1563	1.1250	0.9063	17500	27300			1.51
3476/ 3420	31.750	79.375	29.370	29.771	23.812	93000	114000	4900	6600	0.767
	1.2500	3.1250	1.1563	1.1721	0.9375	20900	25600			1.69
M88048/ M88010	33.338	68.262	22.225	22.225	17.462	56500	71000	5700	7500	0.378
	1.3125	2.6875	0.8750	0.8750	0.6875	12700	16000			
14130/ 14276	33.338	69.012	19.845	19.583	15.875	48500	58000	5600	7400	0.344
	1.3125	2.7170	0.7813	0.7710	0.6250	10800	13000			0.758
14131/ 14276	33.338	69.012	19.845	19.583	15.875	48500	58000	5600	7400	0.346
	1.3125	2.7170	0.7813	0.7710	0.6250	10800	13000			0.763
2585/ 2523	33.338	69.850	23.812	25.357	19.050	69000	81500	5700	7600	0.435
	1.3125	2.7500	0.9375	0.9983	0.7500	15500	18300			0.959
3196/ 3120	33.338	72.626	30.162	29.997	23.812	84500	98000	5500	7300	0.581
	1.3125	2.8593	1.1875	1.1810	0.9375	19000	22000			1.28
HM88547/ HM88510	33.338	73.025	29.370	27.783	23.020	72000	97000	5400	7100	0.604
	1.3125	2.8750	1.1563	1.0938	0.9038	16200	21800			1.33
2785/ 2720	33.338	76.200	23.812	25.654	19.050	73000	90500	5100	6800	0.551
	1.3125	3.0000	0.9375	1.0100	0.7500	16400	20300			1.22
2790/ 2720	33.338	76.200	23.812	25.654	19.050	73000	90500	5100	6800	0.553
	1.3125	3.0000	0.9375	1.0100	0.7500	16400	20300			1.22
HM89443/ HM89410	33.338	76.200	29.370	28.575	23.020	78000	105000	5100	6800	0.668
	1.3125	3.0000	1.1563	1.1250	0.9063	17500	23700			1.47
HM89444/ HM89410	33.338	76.200	29.370	28.575	23.020	78000	105000	5100	6800	0.665
	1.3125	3.0000	1.1563	1.1250	0.9063	17500	23700			1.47
43131/ 43312	33.338	79.375	25.400	24.074	17.462	65500	67000	4600	6200	0.568
	1.3125	3.1250	1.0000	0.9478	0.6875	14700	15000			1.25
LM48548/ LM48510	34.925	65.088	18.034	18.288	13.970	46500	56000	5700	7600	0.249
	1.3750	2.5625	0.7100	0.7200	0.5500	10500	12800			0.549
LM48548A/ LM48510	34.925	65.088	18.034	18.288	13.970	46500	56000	5700	7600	0.252
	1.3750	2.5625	0.7100	0.7200	0.5500	10400	12800			0.556
14137A/ 14276	34.925	69.012	19.845	19.583	15.875	48500	58000	5600	7400	0.333
	1.350	2.7170	0.7813	0.7710	0.6250	10800	13000			0.734
14138A/ 14276	34.925	69.012	19.845	19.583	15.875	48500	58000	5600	7400	0.331
	1.3750	2.7170	0.7813	0.7710	0.6250	10800	13000			0.730
HM88649/ HM88610	34.925	72.233	25.400	25.400	19.842	65000	84500	5400	7200	0.489
	1.3150	2.8438	1.0000	1.0000	0.7812	14600	19000			1.08
16137/ 16284	34.925	72.238	20.638	20.638	15.875	48000	58500	5300	7000	0.385
	1.3750	2.8440	0.8125	0.8125	0.6250	10800	13100			0.849
02877/ 02820	34.925	73.025	22.225	22.225	17.462	56500	68000	5300	7000	0.422
	1.3750	2.8750	0.8750	0.8750	0.6875	12700	15300			0.930
02878/ 02820	34.925	73.025	22.225	22.225	17.462	56500	68000	5300	7000	0.425
	1.3750	2.8750	0.8750	0.8750	0.6875	12700	15300			0.937



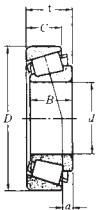
Single Row Inch Series d 34.925~36.512mm 1.3750~1.437inch

Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
2878	34.925	73.025	22.225	23.812	17.462	62500	75500	5200	7000	0.434
2820	1.3750	2.8750	0.8750	0.9375	0.6875	14100	17000			0.957
25877/	34.925	73.025	23.812	24.608	19.050	71000	85000	5300	7100	0.471
25820	1.3750	2.8750	0.9375	0.9688	0.7500	15900	19200			1.04
25877/	34.925	73.025	23.812	24.608	19.050	71000	85000	5300	7100	0.474
25821	1.3750	2.8750	0.9375	0.9688	0.7500	15900	19200			1.05
25878/	34.925	73.025	23.812	24.608	19.050	71000	85000	5300	7100	0.471
25821	1.3750	2.8750	0.9375	0.9688	0.7500	15900	19200			1.04
2739/	34.925	73.025	23.812	25.654	19.050	73000	90500	5100	6800	0.485
2735X	1.3750	2.8750	0.9375	1.0100	0.7500	16400	20300			0.485
2793/	34.925	76.200	23.812	25.654	19.050	73000	90500	5100	6800	0.536
2720	1.3750	3.0000	0.9375	1.0100	0.7500	16400	20300			1.18
2793/	34.925	76.200	23.812	25.654	19.050	73000	90500	5100	6800	0.541
2729	1.3750	3.0000	0.9375	1.0100	0.7500	16400	20300			1.19
2796/	34.925	76.200	23.812	25.654	19.050	73000	90500	5100	6800	0.533
2720	1.3750	3.0000	0.9375	1.0100	0.7500	116400	20300			1.18
HM89446/ HM89410	34.925	76.200	29.370	28.575	23.020	78000	105000	5100	6800	0.646
	1.3750	3.0000	1.1563	1.1250	0.9063	17500	23700			1.42
31593/ 31520	34.925	76.200	29.370	28.575	23.812	80500	97000	5100	6800	0.625
	1.3750	3.0000	1.1563	1.1250	0.9375	18100	21800			1.38
31594/ 31521	34.925	76.200	29.370	28.575	23.812	80500	97000	5100	6800	0.631
	1.3750	3.0000	1.1563	1.1250	0.9375	18100	21800			1.39
3478/ 3420	34.925	79.375	29.370	29.771	23.812	93000	114000	4900	6600	0.725
	1.3750	3.1250	1.1563	1.1721	0.9375	20900	25600			1.60
3379/ 3320	34.925	80.167	29.370	30.391	23.812	95000	112000	4800	6400	0.732
	1.3750	3.1562	1.1563	1.1965	0.9375	21400	25100			1.61
3872/ 3820	34.925	85.725	30.162	30.162	23.812	10500	13200	4500	6000	0.897
	1.3750	3.3750	1.1875	1.1875	0.9375	2360	29600			1.98
14139/ 14276	34.976	69.012	19.845	19.583	15.875	48500	58000	5600	7400	0.333
	1.3770	2.7170	0.7813	0.7710	0.6250	10800	13000			0.734
L68149/ L68111	34.988	59.974	15.875	16.764	11.938	35500	47500	6100	8100	0.179
	1.3775	2.3612	0.6250	0.6600	0.4700	7950	10700			0.395
LM78349A/ LM78310A	34.988	61.973	16.700	17.000	13.600	37000	48000	5900	7900	0.209
	1.3775	2.4399	0.6575	0.6693	0.5354	8350	10800			0.461
LM78349/ LM78310C	34.988	61.973	18.000	17.000	15.000	37000	48000	5900	7900	0.218
	1.3775	2.4399	0.7087	0.6693	0.5906	8350	10800			0.481
JS3549A/ JS3510	35.000	70.000	24.000	23.500	19.000	62000	78000	5500	7300	0.420
	1.3780	2.7559	0.9449	0.9525	0.7480	14000	17500			0.926
26883/ 26822	35.000	79.375	23.812	25.400	19.050	76500	97500	4800	6400	0.610
	1.3780	3.1250	0.9375	1.0000	0.7500	17200	21900			1.35
339/ 332	35.000	80.000	21.000	22.403	17.826	68000	75000	4700	6300	0.534
	1.3780	3.1496	0.8268	0.8820	0.7018	15300	16900			1.18
HM88648/ HM88610	35.717	72.233	25.400	25.400	19.842	65000	84500	5400	7200	0.478
	1.4062	2.8438	1.0000	1.0000	0.7812	14600	19000			1.05
HM88648/ HM88611AS	35.717	72.626	25.400	25.400	19.842	65000	84500	5400	7200	0.482
	1.4062	2.8593	1.0000	1.000	0.7812	14600	19000			1.06
25880/ 25821	36.487	73.025	23.812	24.608	19.050	71000	85000	5300	7100	0.457
	1.4365	2.8750	0.9375	0.9688	0.7500	15900	19200			1.01
2780/ 2720	36.487	76.200	23.812	25.654	19.050	73000	90500	5100	6800	0.518
	1.4365	3.0000	0.9375	1.0100	0.7500	16400	20300			1.14
2794/ 2720	36.487	76.200	23.812	25.654	19.050	73000	90500	5100	6800	0.516
	1.4365	3.0000	0.9375	1.0100	0.7500	16400	20300			1.14
HM89448/ HM89410	36.512	76.200	29.370	28.575	23.020	78000	105000	5100	6800	0.629
	1.4375	3.0000	1.1563	1.1250	0.9063	17500	23700			1.39
HM89449/ HM89410	36.512	76.200	29.370	28.575	23.020	78000	105000	5100	6800	0.626
	1.4375	3.0000	1.1563	1.1250	0.9063	17500	23700			1.38
HM89449/ HM89411	36.512	76.200	29.370	28.575	23.020	78000	105000	5100	6800	0.631
	1.4375	3.0000	1.1563	1.1250	0.9063	17500	23700			1.39
31597/ 31520	63.512	76.200	29.370	28.575	23.812	80500	97000	5100	6800	0.605
	1.4375	3.0000	1.1563	1.1250	0.9375	18100	21800			1.33
HM89249/ HM89210	36.512	79.375	29.370	28.829	22.664	86500	10400	5000	6600	0.686
	1.4375	3.1250	1.1563	1.1350	0.8923	19400	23400			1.51
3479/ 3420	36.512	79.375	29.370	29.771	23.812	93000	114000	4900	6600	0.707
	1.4375	3.1250	1.1563	1.1721	0.9375	20900	25600			1.56
44143/ 44348	36.512	88.500	25.400	23.698	17.462	79500	78000	4900	5300	0.729
	1.4375	3.4843	1.0000	0.9330	0.6875	15900	17500			1.61

Single Row Inch d 38.000mm~39.688mm 1.4961~1.5625inch



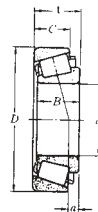
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
JL69349/ JL69310	38.000 1.4961	63.000 2.4803	17.000 0.6693	17.000 0.6693	13.500 0.5315	38500 8700	52500 11800	5700	7600	0.198 0.437
13889/ 13830	38.100 1.5000	63.500 2.5000	12.700 0.5000	11.908 0.4688	9.525 0.3750	25900 5800	33500 7500	5500	7300	0.147 0.324
LM29748/ LM29710	38.100 1.5000	65.088 2.5625	18.034 0.7100	18.288 0.7200	13.970 0.5500	43500 9750	57000 12800	5500	7400	0.233 0.514
LM29749/ LM29710	38.100 1.5000	65.088 2.5625	18.034 0.7100	18.288 0.7200	13.970 0.5500	43500 9750	57000 12800	5500	7400	0.235 0.518
LM29749/ LM29711	38.100 1.50000	65.088 2.5625	19.812 0.7800	18.288 0.7200	15.748 0.6200	43500 9750	57000 12800	5500	7400	0.250 0.551
13685/ 13621	38.100 1.5000	69.012 2.7170	19.050 0.7500	19.050 0.7500	15.083 0.5938	47500 10700	59500 13400	5300	7100	0.293 0.646
13687/ 13621	38.100 1.5000	69.012 2.7170	19.050 0.7500	19.050 0.7500	15.083 0.5938	47500 10700	59500 13400	5300	7100	0.296 0.653
19150/ 19281	38.100 1.5000	71.438 2.8125	15.875 0.6250	16.520 0.6504	11.908 0.4688	43500 9750	51000 11500	5400	7200	0.273 0.602
19150/ 19283	38.100 1.5000	72.100 2.8346	17.018 0.6700	16.520 0.6504	14.288 0.5625	43500 9750	51000 11500	5400	7200	0.300 0.661
16150/ 16282	38.100 1.5000	72.000 2.8346	19.000 0.7480	20.638 0.8125	14.237 0.5605	48000 10800	58500 13100	5300	7000	0.331 0.730
16150/ 16284	38.100 1.5000	72.238 2.8440	20.638 0.8125	20.638 0.8125	15.875 0.6250	48000 10800	58500 13100	5300	7000	0.355 0.783
28150/ 28300	38.100 1.5000	76.200 3.0000	20.638 0.8125	20.940 0.8440	15.507 0.6105	55500 12500	63000 14200	5000	6700	0.405 0.893
2776/ 2720	38.100 1.5000	76.200 3.0000	23.812 0.9375	25.654 1.0100	19.050 0.7500	73000 16400	90500 20300	5100	6800	0.495 1.09
2777/ 2720	38.100 1.5000	76.200 3.0000	23.812 0.9375	25.654 1.0100	19.050 0.7500	73000 16400	90500 20300	5100	6800	0.492 1.09
2788/ 2720	38.100 1.5000	76.200 3.0000	23.812 0.9375	25.654 1.0100	19.050 0.7500	73000 16400	90500 20300	5100	6800	0.497 1.10
2788A/ 2720	38.100 1.5000	76.200 3.0000	23.812 0.9375	25.654 1.0100	19.050 0.7500	73000 16400	90500 20300	5100	6800	0.499 1.10
26878/ 26822	38.100 1.5000	79.375 3.1250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	90500 20300	4800	6400	0.574 1.27
3490/ 3420	38.100 1.5000	79.375 3.1250	29.370 1.1563	29.771 1.1721	23.812 0.9375	93000 20900	11400 25600	4900	6600	0.683 1.51
28150/ 28315	38.100 1.5000	80.000 3.1496	21.006 0.8270	20.940 0.8244	15.875 0.6250	55500 12500	63000 14200	5000	6700	0.467 1.03
27880/ 27820	38.100 1.5000	80.035 3.1510	24.608 0.9688	23.698 0.9330	18.512 0.7288	67000 15100	82500 18500	4800	6400	0.562 1.24
27881/ 27820	38.100 1.5000	80.035 3.1510	24.608 0.9688	23.698 0.9330	18.512 0.7288	67000 15100	82500 18500	4800	6400	0.559 1.23
HM801346/ HM801310	38.100 1.5000	82.550 3.2500	29.370 1.1563	28.575 1.1250	23.020 0.9063	87000 19500	117000 26300	4700	6200	0.767 1.69
25572/ 25520	38.100 1.5000	82.931 3.2650	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.645 1.42
3875/ 3820	38.100 1.5000	85.725 3.3750	30.162 1.1875	30.162 1.1875	23.812 0.9375	105000 23600	132000 29600	4500	6000	0.857 1.89
3876/ 3820	38.100 1.5000	85.725 3.3750	30.162 1.1875	30.162 1.1875	23.812 0.9375	105000 23600	132000 29600	4500	6000	0.857 1.88
3580/ 3525	38.100 1.5000	87.312 3.4375	30.162 1.1875	30.886 1.2160	23.816 0.9375	94000 21200	11700 26400	4400	5900	0.881 1.94
44150/ 44348	38.100 1.5000	88.500 3.4843	25.400 1.0000	23.698 0.9330	17.462 0.6875	70500 15900	78000 17500	4000	5300	0.711 1.57
418/ 414	38.100 1.5000	88.500 3.4843	29.988 1.0625	29.083 1.1450	22.225 0.8750	95500 21500	107000 24100	4600	6100	0.840 1.85
2789/ 2720	39.688 1.5625	76.200 3.0000	23.812 0.9375	25.654 1.0100	19.050 0.7500	73000 16400	90500 20300	5100	6800	0.477 1.05
3382/ 3321	39.688 1.5625	77.534 3.0525	29.370 1.1563	30.391 1.1965	23.812 0.9375	95000 21400	112000 25100	4800	6400	0.554 1.48
26880/ 26822	39.688 1.5625	79.375 3.1250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	97500 21900	4800	6400	0.554 1.22
26881/ 26822	39.688 1.5625	79.375 3.1250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	97500 21900	4800	6400	0.552 1.22
3382/ 3339	39.688 1.5625	80.035 3.1510	29.370 1.1563	30.391 1.1965	23.812 0.9375	95000 21400	11200 25100	4800	6400	0.666 1.47
3382/ 3320	39.688 1.5625	80.167 3.1562	29.370 1.1563	30.391 1.1965	23.812 0.9375	95000 21400	112000 25100	4800	6400	0.665 1.47
3382/ 3331	39.688 1.5625	80.167 3.1562	29.370 1.1563	30.391 1.1965	23.812 0.9375	95000 21400	112000 25100	4800	6400	0.670 1.48



Single Row (Inch) d 39.688~41.275mm 1.5625~1.6250inch

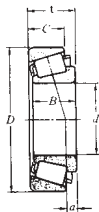
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
3386/ 3320	39.688 1.5625	80.167 3.1562	29.370 1.1563	30.391 1.1965	23.812 0.9375	95000 21400	112000 25100	4800	6400	0.668 1.47
44158/ 44348	39.688 1.5625	88.500 3.4843	25.400 1.0000	23.698 0.9330	17.462 0.6875	70500 15900	78000 17500	4000	5300	0.691 1.52
28158/ 28300	40.000 1.5748	76.200 3.0000	20.638 0.8125	20.940 0.8244	15.507 0.6105	55500 12500	63000 14200	5000	6700	0.386 0.851
344/ 332	40.000 1.5748	80.000 3.1496	21.000 0.8268	22.403 0.8820	17.826 0.7018	68000 15300	75000 16900	4700	6300	0.479 1.06
344A/ 332	40.000 1.5748	80.000 3.1496	21.000 0.8268	22.403 0.8820	17.826 0.7018	68000 15300	75000 16900	4700	6300	0.482 1.06
350A/ 354A	40.000 1.5748	85.000 3.3465	20.638 0.8125	21.692 0.8540	17.462 0.6875	69500 15700	79500 17800	4400	5800	0.562 1.24
420/ 414	40.000 1.5748	88.500 3.4843	26.988 1.0625	29.083 1.1450	22.225 0.8750	95500 21500	107000 24100	4600	6100	0.813 1.79
543/ 532X	40.000 1.5748	107.950 4.2500	36.512 1.4375	36.957 1.4550	28.575 1.1250	141000 32000	177000 40000	3600	4800	1.77 3.90
HM801349/ HM801310	40.483 1.5748	82.550 3.2500	29.370 1.1563	28.575 1.1250	23.020 0.9063	87000 19500	117000 26300	4700	6200	0.731 1.61
LM300849/ LM300811	40.988 1.6137	67.975 2.6762	17.500 0.6890	18.000 0.7087	13.500 0.5315	46000 10300	62500 14100	5300	7000	0.239 1.527
18590/ 18520	41.275 1.6250	736.025 2.8750	16.667 0.6562	17.462 0.6875	12.700 0.5000	46000 10300	55500 12500	5000	6600	0.281 1.619
LM501349/ LM501310	41.275 1.6250	73.431 2.8910	19.558 0.7700	19.812 0.7800	14.732 0.5800	56000 12600	69500 15700	5000	6600	0.335 0.739
LM501349/ LM501314	41.275 1.6250	73.431 2.8910	21.430 0.8437	19.812 0.7800	16.604 0.6537	56000 12600	69500 15700	5000	6600	0.355 0.783
11162/ 11300	41.275 1.6250	76.200 3.0000	18.009 0.7090	17.384 0.6844	14.288 0.5625	42500 9550	51500 11600	4900	6500	0.337 0.743
24780/ 24720	41.275 1.6250	76.200 3.0000	22.225 0.8750	23.020 0.9063	17.462 0.6875	65000 14600	80500 18100	4900	6500	0.432 0.952
26882/ 26823	41.275 1.6250	76.200 3.0000	25.400 1.0000	25.400 1.0000	20.638 0.8125	76500 17200	97500 21900	4800	6400	0.488 1.08
26882/ 26822	41.275 1.6250	79.375 3.1250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	97500 21900	4800	6400	0.531 1.17
26882/ 26822A	41.275 1.6250	79.375 3.1250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	97500 21900	4800	6400	0.528 1.16
26885/ 26822	41.275 1.6250	79.375 3.1250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	97500 21900	4800	6400	0.535 1.18
11162/ 11315	41.275 1.6250	80.000 3.1496	18.009 0.7090	17.384 0.6844	14.288 0.5625	42500 9550	51500 11600	4900	6500	0.389 0.858
336/ 332	41.275 1.6250	80.000 3.1496	21.000 0.8268	22.403 0.8820	17.826 0.7018	68000 15300	75000 16900	4700	6300	0.468 1.03
342/ 332	41.275 1.6250	80.000 3.1496	21.000 0.8268	22.403 0.8820	17.826 0.7018	68000 15300	75000 16900	4700	6300	0.465 1.03
26882/ 26824	41.275 1.6250	80.000 3.1496	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	97500 21900	4800	6400	0.542 1.20
26882/ 26820	41.275 1.6250	80.167 3.1562	25.400 1.0000	25.400 1.0000	20.638 0.8125	76500 17200	97500 21900	4800	6400	0.563 1.24
M802048/ M802011	41.275 1.6250	82.550 3.2500	26.543 1.0450	25.654 1.0100	20.193 0.7950	80500 18100	104000 23400	4600	6100	0.642 1.42
3880/ 3820	41.275 1.6250	85.725 3.3750	30.162 1.1875	30.162 1.1875	23.812 0.9375	105000 23600	132000 29600	4500	6000	0.810 1.79
3576/ 3525	41.275 1.6250	87.312 3.4375	30.162 1.1875	30.886 1.2160	23.812 0.9375	94000 21200	117000 26400	4400	5900	0.834 1.84
3577/ 3525	41.275 1.6250	87.312 3.4375	30.162 1.1875	30.886 1.2160	23.812 0.9375	94000 21200	117000 26400	4400	5900	0.831 1.83
3585/ 3525	41.275 1.6250	87.312 3.4375	30.162 1.1875	30.886 1.2160	23.812 0.9375	94000 21200	117000 26400	4400	5900	0.833 1.84
HM803145/ HM803110	41.275 1.6250	88.900 3.5000	30.162 1.1875	29.370 1.1563	23.020 0.9063	93500 21000	125000 28000	4300	5800	0.901 1.99
HM803146/ HM803110	41.275 1.6250	88.900 3.5000	30.162 1.1875	29.370 1.1563	23.020 0.9063	93500 21000	125000 28000	4300	5800	0.898 1.98
4388/ 4335	41.275 1.6250	90.488 3.5625	39.688 1.5625	40.386 1.5900	33.338 1.3125	136000 30500	175000 39500	4300	5800	1.25 2.76
M903345/ M903310	41.275 1.6250	92.075 3.6250	26.195 1.0313	23.812 0.9375	16.670 0.6536	72500 16300	81500 18300	3800	5000	0.758 1.67
46162/ 46368	41.275 1.6250	93.662 3.6875	31.750 1.2500	31.750 1.2500	26.195 1.0313	103000 23300	131000 29500	4100	5500	1.09 2.40
HM804840/ HM804810	41.275 1.6250	95.250 3.7500	30.162 1.1875	29.370 1.1563	23.020 0.9063	109000 24400	147000 33000	4000	5300	1.08 2.38

Single Row (Inch) d 41.275~44.450mm 1.6250~1.7500inch



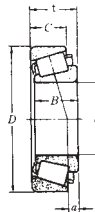
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
53162/ 53375	41.275 1.6250	95.250 3.7500	30.958 1.2188	28.300 1.142	20638 0.8125	82500 18500	92000 20600	3700	5000	0.975 2.15
HM903245/ HM903210	41.275 1.6250	95.250 3.7500	30.958 1.2188	28.575 1.1250	22.225 0.8750	96000 21600	116000 26100	3700	4900	1.05 2.32
4395/ 4335	42.070 1.6563	94.488 3.5625	39.688 1.5625	40.386 1.5900	33.338 1.3125	136000 30500	175000 39500	4300	5800	1.24 2.73
22780/ 22720	42.862 1.6875	82.550 3.2500	26.195 1.0313	26.988 1.0625	20.638 0.8125	75500 16900	97000 21800	4600	6100	0.617 1.36
25578/ 25520	42.862 1.6875	82.931 3.2650	23.812 0.9375	25.400 1.0000	19050 0.7500	76000 17100	98000 22000	4500	6000	0.584 1.29
3579/ 3525	42.862 1.6875	87.312 3.4375	30.162 1.1875	30.886 1.2160	23.812 0.9375	94000 21200	11700 26400	4400	5900	0.805 1.78
26884/ 26822	42.875 1.6880	79.375 3.1250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	97500 21900	4800	6400	0.510 1.12
26886/ 26822	42.875 1.6880	79.375 3.1250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76500 17200	97500 21900	4800	6400	0.0513 1.13
25577/ 25520	42.875 1.6880	82.931 3.2650	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.581 1.28
12175/ 12303	44.450 1.7500	76.992 3.0312	17.462 0.6875	17.145 0.6750	11.908 0.4688	44000 9850	54000 12200	4700	6300	0.308 0.679
18685/ 18620	44.450 1.7500	79.375 3.1250	17.462 0.6875	17.462 0.6875	13.495 0.5313	45500 10200	56000 12600	4600	6200	0.345 0.761
25580/ 25520	44.450 1.7500	82.931 3.2650	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.560 1.24
25581/ 25520	44.450 1.7500	82.931 3.2650	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.563 1.24
25580/ 25520	44.450 1.7500	92.931 3.6250	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.556 1.23
3578/ 3520	44.450 1.7500	84.138 3.3125	30.162 1.1875	30.886 1.2160	23.812 0.93785	94000 21200	117000 26400	4400	5900	0.699 1.54
355/ 354A	44.450 1.7500	85.000 3.3465	20.638 0.8125	21.692 0.8540	17.462 0.6875	69500 15700	79500 17800	4400	5800	0.511 1.13
355A/ 354A	44.450 1.7500	85.000 3.3465	20.638 0.8125	21.692 0.8540	17.462 0.6875	69500 15700	79500 17800	4400	5800	0.512 1.13
3578/ 3525	44.450 1.7500	87.312 3.4375	30.162 1.1875	30.886 1.2160	23.812 0.9375	94000 21200	117000 26400	4400	5900	0.779 1.72
3578/ 3526	44.450 1.7500	87.312 3.4375	30.162 1.1875	30.886 1.2160	23.812 0.9375	94000 21200	117000 26400	4400	5900	0.784 1.73
HM803149/ HM803110	44.450 1.75	88.900 3.5000	30.162 1.1875	29.370 1.1563	23.020 0.9063	93500 21000	125000 28000	4300	5800	0.849 1.87
3782/ 3720	44.450 1.7500	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.961 2.12
46175/ 46368	44.450 1.7500	93.662 3.6875	31.750 1.2500	31.750 1.2500	26.195 1.0313	103000 23300	131000 29500	4100	5500	1.04 2.29
46176/ 46368	44.450 1.7500	93.662 3.6875	31.750 1.2500	31.750 1.2500	26.195 1.0313	103000 23300	131000 29500	4100	5500	1.03 2.27
33885/ 33821	44.450 1.7500	95.250 3.7500	27.783 1.0938	28.575 1.1250	22.225 0.8750	107000 24100	139000 3100	3900	5200	0.987 2.18
438/ 432	44.450 1.7500	95.250 3.7500	27.783 1.0938	29.900 1.1772	22.225 0.8750	108000 24300	129000 29100	4200	5600	0.953 2.10
438/ 432A	44.450 1.7500	95.250 3.7500	27.783 1.0938	29.900 1.1772	22.225 0.8750	108000 24300	129000 29100	4200	5600	0.956 2.11
HM804842/ HM804810	44.450 1.7500	95.250 3.7500	30.162 1.1875	29.370 1.1563	23.020 0.9063	109000 24400	147000 33000	4000	5300	1.04 2.29
53176 53375	44.450 1.7500	95.250 3.7500	30.958 1.2188	28.300 1.1142	20.638 0.8125	82500 18500	92000 20600	3700	5000	0.928 2.05
53176/ 53377	44.450 1.7500	95.250 3.7500	30.958 1.2188	28.300 1.1142	20.638 0.8125	82500 18500	92000 20600	3700	5000	0.924 2.04
53177/ 53375	44.450 1.7500	95.250 3.7500	30.958 1.2188	28.300 1.1142	20.638 0.8125	82500 18500	92000 20600	3700	5000	0.925 2.04
53178/ 53375	44.450 1.7500	95.250 3.7500	30.958 1.2188	28.300 1.1142	20.638 0.8125	82500 18500	9200 20600	3700	5000	0.927 2.04
HM903249A/ HM903210	44.450 1.7500	95.250 3.7500	30.958 1.2188	28.300 1.1142	22.225 0.8750	96000 21600	116000 21600	3700	4900	0.999 2.20
527/ 522	44.450 1.7500	101.600 4.0000	34.925 1.3750	36.068 1.4200	26.988 1.0625	135000 30500	165000 37000	3800	5000	1.37 3.02
460/ 453X	44.450 1.7500	104.775 4.1250	30.162 1.1875	29.317 1.1542	24.605 0.9687	115000 25800	148000 33000	3500	4700	1.2-9 2.84

Single Row (Inch) d 44.450~47.625mm 1.7500~1.8750inch

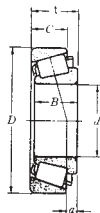


Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
45280/ 45220	44.450 1.7500	104.75 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	130000 29200	169000 38000	3500	4700	1.35 2.98
HM807040/ HM807010	44.450 1.7500	104.775 4.1250	36.512 1.4375	36.512 1.4375	28.575 1.1250	138000 31000	189000 42500	3600	4800	1.62 3.57
55175C/ 55437	44.450 1.7500	111.125 4.3750	30.162 1.1875	26.909 1.0594	20.638 0.8125	104000 23400	136000 30500	3200	4200	1.45 3.20
55176C/ 55437	44.450 1.7500	111.125 4.3750	30.162 1.1875	26.909 1.0594	20.638 0.8125	104000 23400	136000 30500	3200	4200	1.09 2.40
6277/ 6220	44.450 1.7500	127.000 5.0000	50.800 2.0000	52.388 2.0625	41.275 1.6250	250000 56000	320000 72500	3200	4300	3.58 7.89
25584/ 25520	44.983 1.7710	82.931 3.2650	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.555 1.22
3776/ 3720	44.983 1.7710	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.952 2.10
358/ 354A	45.000 1.7717	85.000 3.3465	20.638 0.8125	21.692 0.8540	17.462 0.6875	69500 15700	79500 17800	4400	5800	0.505 1.11
367/ 362A	45.000 1.7717	88.900 3.50000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.595 1.31
3586/ 3525	45.237 1.7810	87.312 3.4375	30.162 1.1875	30.886 1.2160	23.812 0.9375	94000 21200	11700 26400	4400	5900	0.765 1.69
LM102949/ LM102910	45.242 1.7812	73.431 2.8910	19.558 0.7700	19.812 0.7800	15.748 0.6200	54000 12200	76000 17100	4800	6400	0.307 0.667
LM560349/ LM603011	45.242 1.7812	77.788 3.0625	19.842 0.7812	19.842 0.7812	15.080 0.5937	57500 12900	73500 16600	4600	6200	0.372 0.820
LM603049/ LM603012	45.242 1.7812	77.788 3.0625	21.430 0.8437	19.842 0.7812	16.667 0.6662	57500 12900	73500 16600	4600	6200	0.391 0.862
LM603049/ LM603014	45.242 1.7812	79.974 3.1486	19.842 0.7812	19.842 0.7812	15.080 0.5937	57500 12900	73500 16600	4600	6200	0.405 0.893
25590/ 25519	45.618 1.7960	82.550 3.2500	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.534 1.18
25590/ 25520	45.618 1.7960	82.931 3.2650	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.543 1.20
25590/ 25523	45.618 1.7960	82.931 3.2650	26.988 1.0625	25.400 1.0000	22.225 0.8750	76000 17100	98000 22000	4500	6000	0.588 1.30
25590/ 25521	45.618 1.7960	83.058 3.2700	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	9800 22000	4500	6000	0.541 1.19
25590/ 25522	45.618 1.7960	83.058 3.2700	23.876 0.9400	25.400 1.0000	19.114 0.7525	76000 17100	98000 22000	4500	6000	0.545 1.20
25590/ 25526	45.618 1.7960	85.000 3.3465	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.581 1.28
LM503349A/ LM503310	45.987 1.8105	74.976 2.9518	18.000 0.7087	18.000 0.8087	14.000 0.5512	51000 11500	71000 16000	4700	6300	0.296 0.653
18690/ 18620	46.038 1.8125	79.375 3.1250	17.462 0.6875	17.462 0.6875	13.495 0.5313	45500 10200	56000 12600	4600	6200	0.329 0.725
25592/ 25520	46.038 1.8125	82.931 3.2650	23.812 0.9375	25.400 1.0000	19.050 0.7500	76000 17100	98000 22000	4500	6000	0.538 1.19
359A/ 354A	46.038 1.8125	85.000 3.3465	20.638 0.8125	21.692 0.8540	17.462 0.6875	69500 15700	79500 17800	4400	5800	0.489 1.08
359S/ 354A	46.038 1.8125	85.000 3.3465	20.638 0.8125	21.692 0.8540	17.462 0.6875	69500 15700	79500 17800	4400	5800	0.491 1.08
2984/ 2924	46.038 1.8125	85.000 3.3465	25.400 1.0000	25.608 1.0082	20.638 0.8125	79000 17700	104000 23400	4400	5800	0.615 1.36
359S/ 352	46.038 1.8125	90.119 3.5480	23.000 0.9055	21.692 0.8540	21.808 0.8586	69500 15700	79500 17800	4400	5800	0.651 1.44
3777/ 3720	46.038 1.8125	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9063	102000 22900	134000 3000	4000	5300	0.934 2.06
436/ 432	46.038 1.8125	95.250 3.7500	27.783 1.0938	29.900 1.1772	22.225 0.8750	108000 24300	129000 29100	4200	5600	0.927 2.04
369A/ 362A	47.625 1.8750	88.900 3.5000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.559 1.23
369S/ 362A	47.625 1.8750	88.900 3.5000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.561 1.24
M804048/ M804010	47.625 1.8750	88.900 3.5000	25.400 1.0000	25.400 1.0000	19.050 0.7500	82000 18500	101000 22800	4200	5600	0.662 1.46
M804049/ M804010	47.625 1.8750	88.900 3.5000	25.400 1.0000	25.400 1.0000	19.050 0.7500	82000 18500	101000 22800	4200	5600	0.657 1.45
3778/ 3720	47.625 1.8750	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.898 1.98

Single Row (Inch) d 47.625~50.800mm 1.8750~2.0000inch



Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
3779/ 3720	47.625 1.8750	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.906 2.00
HM804846/ HM804810	47.625 1.8750	95.250 3.7500	30.162 1.1875	29.370 1.1563	23.020 0.9063	109000 24400	147000 33000	4000	5300	0.978 2.16
386A/ 382A	47.625 1.8750	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.720 1.59
528/ 522	47.625 1.8750	101.600 4.0000	34.925 1.3750	36.068 1.4200	26.988 1.0625	135000 30500	165000 37000	3800	5000	1.30 2.87
463/ 463X	47.625 1.8750	104.775 4.1250	30.162 1.1875	29.317 1.1542	24.605 0.9687	115000 25800	148000 33000	3500	4700	1.24 2.73
467/ 453X	47.625 1.8750	104.775 4.1250	30.162 1.1875	29.317 1.1542	24.605 0.9687	115000 25800	148000 33000	3500	4700	1.24 2.73
45282/ 45220	47.625 1.8750	104.775 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	130000 29200	169000 38000	3500	4700	1.29 2.84
55187C/ 55437	47.625 1.8750	111.125 4.3750	30.162 1.1875	26.909 1.0594	20.638 0.8125	104000 23400	136000 30500	3200	4200	1.40 3.09
72188C/ 72487	47.625 1.8750	123.825 4.8750	36.512 1.4375	32.791 1.2910	25.400 1.0000	154000 345000	188000 42500	2900	3900	2.16 4.76
HM804848/ HM804810	48.412 1.9060	95.250 3.7500	30.162 1.1875	29.370 1.1563	23.020 0.9063	109000 24400	147000 33000	4000	5300	0.967 2.13
HM804849/ HM804810	48.412 1.9060	95.250 3.7500	30.162 1.1875	29.370 1.1563	23.020 0.9063	109000 24400	147000 33000	4000	5300	0.964 2.13
3781/ 3720	49.212 1.9375	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.877 1.93
5395/ 5335	49.212 1.9375	103.188 4.0625	43.658 1.7188	44.475 1.7510	36.512 1.4375	174000 39000	232000 52000	3800	5000	1.75 3.86
HM807044/ HM807010	49.212 1.9375	104.775 4.1250	36.512 1.4375	36.512 1.4375	28.575 1.1250	138000 31000	189000 42500	3600	4800	1.52 3.35
65390/ 65320	49.212 1.9375	114.300 4.5000	44.450 1.7500	44.450 1.7500	34.925 1.3750	186000 42000	225000 50500	3600	4800	2.23 4.92
HH506348/ HH506310	49.212 1.9375	114.300 4.5000	44.450 1.7500	44.450 1.7500	36.068 1.4200	203000 45500	261000 58500	3500	4700	2.33 5.14
LM104947+/ LM104911	49.987 1.9680	82.550 3.2500	21.590 0.8500	22.225 0.8750	16.510 0.6500	69500 15700	94500 21200	4300	5700	0.434 0.957
28579+/ 28520	49.987 1.9680	89.980 3.5425	24.750 0.9744	25.400 1.0000	19.987 0.7869	8350 18800	0116000 26100	4000	5300	0.670 1.48
28579+/ 28521	49.987 1.9680	92.075 3.6250	24.608 0.9688	25.400 1.0000	19.845 0.7813	83500 18800	116000 26100	4000	5300	0.718 1.58
HH506349+/ HH506310	49.987 1.9680	114.300 4.5000	44.450 1.7500	44.450 1.7500	36.068 1.4200	203000 45500	26100 58500	3500	4700	2.27 5.00
JLM104948/ JLM104910	50.00 1.9685	82.000 3.2283	21.500 0.8465	21.500 0.8465	17.000 0.6693	69500 15700	94000 21100	4300	5700	0.420 0.926
JLM104949/ JLM704910	50.000 1.9685	84.000 3.3071	22.000 0.8661	22.000 0.8661	17.500 0.6890	69500 15700	94000 21100	4300	5700	0.466 1.03
365/ 362A	50.000 1.9685	88.900 3.5000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.530 1.17
366/ 362A	50.000 1.9685	88.900 3.5000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.529 1.17
JM205149/ JM205110	50.000 1.9685	90.000 3.5433	28.000 1.1024	28.000 1.1024	23.000 0.9055	106000 23900	141000 31500	4100	5400	0.752 1.66
JM205149A/ JM205110	50.000 1.9685	90.000 3.5433	28.000 1.1024	28.000 1.1027	23.000 0.9055	106000 23900	141000 31500	4100	5400	0.747 1.65
JHM807045/ JHM807012	50.000 1.9685	105.000 4.13339	37.000 1.4567	36.000 1.4173	29.000 1.1417	138000 31000	189000 42500	3600	4800	1.52 3.35
396/ 394A	50.000 1.9685	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	1.06 2.34
LM104949/ LM104911	50.800 2.0000	82.550 3.2500	21.590 0.8500	22.225 0.8750	16.510 0.6500	69500 15700	94000 21100	4300	5700	0.419 0.924
LM104949/ LM104912	50.800 2.0000	82.931 3.2650	21.590 0.8500	22.225 0.8750	16.510 0.6500	69500 15700	94000 21100	4300	5700	0.425 0.937
18790/ 18720	50.800 2.0000	85.000 3.3465	17.462 0.6875	17.462 0.6875	13.495 0.5313	49500 11100	65000 14600	4200	5600	0.374 0.825
18790/ 18724	50.800 2.0000	88.900 3.5000	17.462 0.6875	17.462 0.6875	13.495 0.5313	49500 11100	65000 14600	4200	5600	0.431 0.950
3689 362A	50.800 2.0000	88.900 3.5000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.519 1.14
368A/ 362A	50.800 2.0000	88.900 3.5000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.516 1.14
370A/ 362A	50.800 2.0000	88.900 3.5000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.511 1.13



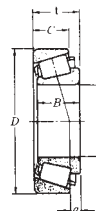
Single Row (Inch)

d 50.800~52.388mm

2.0000~2.0625inch

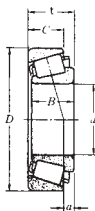
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
368A/ 362	50.800 2.0000	90.000 3.5433	20.000 0.7874	22.225 0.8750	15.875 0.6250	76500 17200	90500 20400	4100	5500	0.525 1.16
368A/ 363	50.800 2.0000	90.000 3.5433	20.000 0.7874	22.225 0.8750	20.000 0.7874	76500 17200	90500 20400	4100	5500	0.556 1.23
28580/ 28521	50.800 2.0000	92.075 3.6250	24.608 0.9688	25.400 1.0000	19.845 0.7813	83500 18800	116000 26100	4000	5300	0.703 1.55
3775/ 3720	50.800 2.0000	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.852 1.88
3780/ 3720	50.800 2.0000	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.848 1.87
3780/ 3730	50.800 2.0000	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.854 1.88
3784/ 3720	50.800 2.0000	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.839 1.85
33889/ 33821	50.800 2.0000	95.250 3.7500	27.783 1.0938	28.575 1.1250	22.225 0.8750	107000 24100	139000 31000	3900	5200	0.876 1.93
3780/ 3726	50.800 2.0000	95.250 3.7500	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.903 1.99
385A/ 382A	50.800 2.0000	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.676 1.49
28678/ 28622	50.800 2.0000	97.630 3.8437	24.608 0.9688	24.608 0.9688	19.446 0.7856	88500 19900	128000 28700	3700	4900	0.852 1.88
3780/ 3732	50.800 2.0000	98.425 3.8750	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 30000	4000	5300	0.993 2.19
49585/ 49520	50.800 2.0000	101.600 4.0000	31.750 1.2500	31.750 1.2500	25.400 1.0000	110000 24800	136000 30500	3700	5000	1.13 2.49
529/ 522	50.800 2.0000	101.600 4.0000	34.925 1.3750	36.068 1.4200	26.988 1.0625	135000 30500	165000 37000	3800	5000	1.24 2.73
529X/ 522	50.800 2.0000	101.600 4.0000	34.925 1.3750	36.068 1.4200	26.988 1.0625	135000 30500	165000 37000	3800	5000	1.23 2.71
455/ 453X	50.800 2.0000	104.775 4.1250	30.162 1.1875	29.317 1.1542	24.605 0.9687	115000 25800	148000 33000	3500	4700	1.19 2.62
455S/ 453X	50.800 2.0000	104.775 4.1250	30.162 1.1875	29.317 1.1542	24.605 0.9687	115000 25800	148000 33000	3500	4700	1.18 2.60
45284/ 45220	50.800 2.0000	104.775 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	130000 29200	169000 38000	3500	4700	1.22 2.69
45285/ 45220	50.800 2.0000	104.775 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	130000 29200	169000 38000	3500	4700	1.23 2.71
45285A/ 45220	50.800 2.0000	104.775 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	130000 29200	169000 38000	3500	4700	1.23 2.71
HM807046/ HM807010	50.800 2.0000	104.775 4.1250	36.512 1.4375	36.512 1.4375	28.575 1.1250	138000 31000	189000 42500	3600	4800	1.49 3.29
59200/ 59412	50.800 2.0000	104.775 4.1250	36.512 1.4375	36.512 1.4375	28.575 1.1250	143000 32000	178000 4000	3700	4900	1.44 3.18
537/ 532X	50.800 2.0000	107.950 4.2500	36.512 1.4375	36.957 1.4550	28.575 1.1250	141000 32000	177000 4000	3600	4800	1.55 3.42
HM907643/ HM907614	50.800 2.0000	111.125 4.3750	30.162 1.1875	28.575 1.1250	20.638 0.8125	104000 23400	136000 30500	3200	4200	1.36 3.00
55200C/ 55443	50.800 2.0000	112.712 4.4375	30.162 1.1875	26.909 1.0594	20.638 0.8125	104000 23400	136000 30500	3200	4200	1.34 2.95
3975/ 3920	50.800 2.0000	112.712 4.4375	30.162 1.1875	30.048 1.1830	23.812 0.9375	119000 26800	174000 390000	3200	4300	1.53 3.37
39573/ 39520	50.800 2.0000	112.712 4.4375	30.162 1.1875	30.162 1.1875	23.812 0.9375	138000 31000	195000 43500	3200	4200	1.55 3.42
39575/ 39520	50.800 2.0000	112.712 4.4375	30.162 1.1875	30.162 1.1875	23.812 0.9375	138000 31000	195000 43500	3200	4200	1.54 3.40
66200/ 66462	50.800 2.0000	117.475 4.6250	33.338 1.3125	31.750 1.2500	23.812 0.9375	130000 29100	153000 345000	3300	4400	1.67 3.68
619/ 612	50.800 2.0000	120.650 4.7500	41.275 1.6250	41.275 1.6250	31.750 1.2500	172000 38500	21300 4800	3300	4400	2.30 5.07
72200C/ 72487	50.800 2.0000	123.825 4.8750	36.512 1.4375	32.791 1.2910	25.400 1.0000	154000 34500	18800 42500	2900	3900	2.10 4.63
72201C/ 72487	50.800 2.0000	123.825 4.8750	36.512 1.4375	32.791 1.2910	25.400 1.0000	154000 34500	18800 42500	2900	3900	2.10 4.63
555/ 552A	50.800 2.0000	123.825 4.8750	38.100 1.500	36.678 1.4440	30.162 1.1875	158000 35500	216000 48500	3000	4100	2.34 5.16
368S/ 362A	51.592 2.0312	88.900 3.5000	20.638 0.8125	22.225 0.8750	16.513 0.6501	76500 17200	90500 20400	4100	5500	0.507 1.12
28584/ 28521	52.388 2.0625	92.075 3.6250	24.608 0.9688	25.400 1.0000	19.845 0.7813	83500 18800	116000 26100	4000	5300	0.677 1.49
3767/ 3720	52.388 2.0625	93.264 3.6718	30.162 1.1875	30.302 1.1930	23.812 0.9375	102000 22900	134000 3000	4000	5300	0.819 1.81

Single Row (Inch) d 57.150~60.325mm 2.2500~2.3750inch



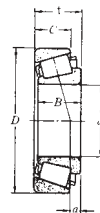
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
28682/ 28622	57.150 2.2500	97.630 3.8437	24.608 0.9688	24.608 0.9688	19.446 0.7656	885000 19900	128000 28700	3700	4900	0.747 1.65
387A/ 382	57.150 2.2500	98.425 3.8750	21.000 0.8268	21.946 0.8640	17.826 0.7018	78000 17600	96500 21700	3700	5000	0.628 1.38
387A/ 383A	57.150 2.2500	100.000 3.9370	21.000 0.8268	21.946 0.8640	17.826 0.7018	78000 17600	96500 21700	3700	5000	0.660 1.46
462/ 453X	57.150 2.2500	104.775 4.1250	30.162 1.1875	29.317 1.1542	24.605 0.9687	115000 25800	148000 33000	3500	4700	1.06 2.34
469/ 453X	57.150 2.2500	104.775 4.1250	30.162 1.1875	29.317 1.1542	24.605 0.9687	115000 25800	148000 33000	3500	4700	1.06 2.34
45289/ 45220	57.150 2.2500	104.775 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	130000 29200	169000 38000	3500	4700	1.10 2.43
45290/ 45220	57.150 2.2500	104.775 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	130000 29200	169000 38000	3500	4700	1.10 2.43
45291/ 45220	57.150 2.2500	104.775 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	13000 29200	169000 38000	3500	4700	1.09 2.40
469/ 453A	57.150 2.2500	107.950 4.2500	27.783 1.0938	29.317 1.1542	22.225 0.8750	115000 25800	148000 33000	3500	4700	1.11 2.45
390/ 394A	57.150 2.2500	110.000 4.3307	22.000 0.8661	21.946 0.8640	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.954 2.10
469/ 454	57.150 2.2500	110.000 4.3307	27.795 1.0943	29.317 1.1542	27.000 1.0630	115000 25800	148000 33000	3500	4700	1.24 2.73
3979/ 3920	57.150 2.2500	112.712 4.4375	30.162 1.1875	30.048 1.1830	23.812 0.9375	119000 26800	174000 39000	3200	4300	1.40 3.09
39580/ 39520	57.150 2.2500	112.712 4.4375	30.162 1.1875	30.162 1.1875	23.812 0.9375	138000 31000	195000 43500	3200	4200	1.41 3.11
39581/ 39520	57.150 2.2500	112.712 4.4375	30.162 1.1875	30.162 1.1875	23.812 0.9375	138000 31000	195000 43500	3200	4200	1.40 3.09
33225/ 33462	57.150 2.2500	117.475 4.6250	30.162 1.1875	30.162 1.1875	23.812 0.9375	117000 26200	175000 39500	3000	4000	1.58 3.48
66225/ 66462	57.150 2.2500	117.475 4.6250	33.338 1.3125	31.750 1.2500	23.812 0.9375	130000 29100	153000 34500	3300	4400	1.54 3.40
623/ 612	57.150 2.2500	120.650 4.7500	41.275 1.6250	41.275 1.6250	31.750 1.2500	172000 38500	213000 48000	3300	4400	2.12 4.67
72225C/ 72487	57.150 2.2500	123.825 4.8750	36.512 1.4375	32.791 1.291	25.400 1.0000	154000 34500	188000 42500	2900	3900	1.96 4.32
5555/ 552A	57.150 2.2500	123.825 4.8750	38.100 1.5000	36.678 1.4440	30.162 1.1875	158000 35500	216000 48500	3000	4100	2.18 4.81
78225/ 78551	57.150 2.2500	104.030 5.5130	36.512 1.4375	33.236 1.3085	23.520 0.9260	171000 38500	212000 47500	2600	3400	2.69 5.93
388A/ 382A	57.531 2.2650	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.575 1.27
66589/ 66520	59.972 2.3611	122.238 4.8125	33.338 1.3125	31.750 1.2500	23.812 0.9375	134000 30000	163000 36500	3100	4200	1.66 3.66
H913840/ H913810	59.987 2.3617	146.050 5.7500	41.275 1.6250	39.688 1.5625	25.400 1.0000	199000 744500	234000 52500	2400	3200	3.22 7.10
JLM508748/ JLM508710	60.000 2.3622	95.000 3.7402	24.000 0.9449	24.000 0.9449	19.000 0.7480	83000 18700	122000 27300	3700	4900	0.606 1.34
29580/ 29520	60.000 2.3622	107.950 4.2500	25.400 1.0000	25.400 1.0000	19.050 0.7500	91500 20600	140000 31500	3200	4300	0.992 2.19
29582/ 29520	60.000 2.3622	107.950 4.2500	25.400 1.0000	25.400 1.0000	19.050 0.7500	91500 20600	140000 31500	3200	4300	0.997 2.20
397/ 394A	60.000 2.3622	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.910 2.01
JHM911244/ JHM911211	60.000 2.3622	130.000 5.1181	34.100 1.3425	30.924 1.2175	22.650 0.8917	156000 35000	186000 42000	2700	3600	2.01 4.43
28985/ 28919	60.325 2.3750	99.979 3.9362	24.605 0.9687	25.400 1.0000	19.050 0.7500	90500 20300	134000 3000	3500	4700	0.762 1.68
28925/ 28921	60.325 2.3750	100.000 3.9370	25.400 1.0000	25.400 1.0000	19.845 0.7813	90500 20300	134000 30000	3500	4700	0.772 1.70
28985/ 28920	60.325 2.3750	101.600 4.0000	25.400 1.0000	25.400 1.0000	19.845 0.7813	90500 20300	134000 30000	3500	4700	0.811 1.79
3980/ 3920	60.325 2.3750	112.712 4.4375	30.162 1.1875	30.048 1.1830	23.812 0.9375	119000 26800	174000 39000	3200	4300	1.33 2.93
HM212044/ HM212011	60.325 2.3750	122.238 4.8125	38.100 1.5000	38.354 1.5100	29.718 1.1700	187000 42000	244000 55000	3100	4100	2.02 4.45
5583/ 5535	60.325 2.3750	122.238 4.8125	43.658 1.7188	43.764 1.7230	36.512 1.4375	194000 43500	283000 63500	3100	4100	2.44 5.38
558/ 552A	60.325 2.3750	123.825 4.8750	38.100 1.5000	36.678 1.4440	30.162 1.1875	158000 35500	216000 48500	3000	4100	2.10 4.63

Single Row (Inch) d 52.388~57.150mm 2.0625~2.2500inch



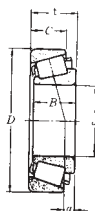
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
33890/ 33821	52.388 2.0625	95.250 3.7500	27.783 1.0938	28.575 1.1250	22.225 0.8750	107000 24100	139000 31000	3900	5200	0.851 1.88
33891/ 33821	52.388 2.0625	95.250 3.7500	27.783 1.0938	28.575 1.1250	22.225 0.8750	107000 24100	139000 31000	3900	5200	0.847 1.87
LM806649/ LM806610	53.975 2.1250	88.900 3.5000	19.050 0.7500	19.050 0.7500	13.492 0.5312	61000 13700	82500 18600	4000	5300	0.437 0.963
33895/ 33821	53.975 2.1250	95.250 3.7500	27.783 1.1938	28.575 1.1250	22.225 0.8750	107000 24100	139000 31000	3900	5200	0.821 1.81
33895/ 33822	53.975 2.1250	95.250 3.7500	27.783 1.0938	28.575 1.1250	22.225 0.8750	107000 24100	139000 31000	3900	5200	0.824 1.82
389A/ 382A	53.975 2.1250	96.838 3.8125	21.000 0.8268	121.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.633 1.40
45287/ 45220	53.975 2.1250	104.775 4.1250	30.162 1.1875	30.958 1.2188	23.812 0.9375	130000 29200	169000 38000	3500	4700	1.17 2.58
HM807049/ HM807010	53.975 2.1250	104.775 4.1250	36.512 1.4375	36.512 1.4375	28.575 1.1250	138000 31000	189000 42500	3600	4800	1.41 3.11
539/ 532X	53.975 2.1250	107.950 4.2500	36.512 1.4375	36.957 1.4550	28.575 1.1250	141000 32000	177000 4000	3600	4800	1.47 3.24
539A/ 532X	53.975 2.1250	107.950 4.2500	36.512 1.4375	36.957 1.4550	28.575 1.1250	141000 32000	177000 40000	3600	4800	1.47 3.24
539/ 532A	53.975 2.1250	111.125 4.3750	38.100 1.5000	36.957 1.4550	30.162 1.1875	141000 32000	177000 40000	3600	4800	1.65 3.64
621/ 612	53.975 2.1250	120.650 4.7500	41.275 1.6250	41.275 1.6250	31.750 1.250	172000 38500	213000 48000	3300	4400	2.21 4.87
66584/ 66520	53.975 2.1250	122.238 4.8125	33.338 1.3125	31.750 1.2500	23.812 0.9375	134000 30000	163000 36500	3100	4200	1.79 3.95
5578/ 5535	53.975 2.1250	122.238 4.8125	43.658 1.7188	43.764 1.7230	36.51 1.4375	194000 43500	283000 63500	3100	4100	2.64 5.82
72212C/ 72487	53.975 2.1250	123.825 4.8750	36.512 1.4375	32.791 1.2910	25.400 1.0000	154000 34500	188000 42500	2900	3900	2.03 4.48
5575/ 552A	53.975 2.1250	123.825 4.8750	38.100 1.5000	36.678 1.4440	30.162 1.1875	158000 35500	216000 48500	3000	4100	2.26 4.98
HM911242/ HM911210	53.975 2.1250	130.175 5.1250	36.512 1.4375	33.338 1.3125	23.812 0.9375	156000 35000	186000 42000	2700	3600	2.27 5.00
78214C/ 78551	53.975 2.1250	140.030 5.5130	36.512 1.4375	33.236 1.3085	23.520 0.9260	171000 38500	212000 47500	2600	3400	2.77 6.11
78215C/ 78551	53.975 2.1250	140.030 5.5130	36.512 1.4375	33.236 1.3085	23.520 0.9260	171000 38500	212000 47500	2600	3400	2.76 6.09
HM807048/ HM807010	54.488 2.1452	140.775 4.1250	36.512 1.4375	36.512 1.4375	28.575 1.1250	138000 31000	189000 42500	3600	4800	1.40 3.09
JLM506849/ JLM506810	55.000 2.1654	90.000 3.5433	23.000 0.9055	23.000 0.9055	18.500 0.7283	77500 17400	109000 24400	3900	5300	0.558 1.23
JM207049/ JM207010	55.000 2.1654	95.000 3.7402	29.000 1.1417	29.000 1.1417	23.500 0.9252	107000 24000	144000 32500	3800	5100	0.820 1.81
385/ 382A	55.000 2.1654	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.616 1.36
385X/ 382A	55.000 2.1654	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.614 1.35
JH307749/ JH307710	55.000 2.1654	110.000 4.3307	39.000 1.5354	39.000 1.5354	32.000 1.2598	173000 39000	219000 49500	3500	4600	1.71 3.77
28680/ 28622	55.562 2.1875	97.630 3.8437	24.608 0.9688	24.608 0.9688	19.446 0.7656	88500 19900	128000 28700	3700	4900	0.774 1.71
72218C/ 72487	55.562 2.1875	123.825 4.8750	36.512 1.4375	32.791 1.2910	25.400 1.0000	154000 34500	188000 42500	2900	3900	1.99 4.39
HM813840/ HM813810	55.562 2.1875	127.000 5.0000	36.512 1.4375	36.512 1.4375	26.988 1.0625	163000 36500	22800 51500	2900	3800	2.34 5.16
389/ 382A	55.575 2.1880	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.608 1.34
387/ 382A	57.150 2.2500	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.583 1.29
387A/ 382A	57.150 2.2500	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.581 1.28
387AS/ 382A	57.150 2.2500	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.576 1.27
387S/ 382A	57.150 2.2500	96.838 3.8125	21.000 0.8268	21.946 0.8640	15.875 0.6250	78000 17600	96500 21700	3700	5000	0.585 1.29
387A/ 382S	57.150 2.2500	96.838 3.8125	25.400 1.0000	21.946 0.8640	20.274 0.7982	78000 17600	96500 21700	3700	5000	0.650 1.43

Single Row (Inch) d 60.325~65.088mm 2.3750~2.5625inch



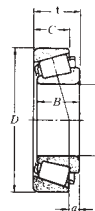
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
HM813841/ HM813810	60.325 2.3750	127.000 5.0000	36.512 1.4375	36.512 1.4375	26.988 1.0625	163000 36500	228000 51500	2900	3800	2.21 4.87
HM813841A/ HM813810	60.325 2.3750	127.000 5.0000	36.512 1.4375	36.512 1.4375	26.988 1.0625	163000 36500	228000 51500	2900	3800	2.20 4.85
65237/ 65500	60.325 2.3750	127.000 5.0000	44.450 1.7500	44.450 1.7500	34.925 1.3750	203000 45500	263000 59000	3100	4200	2.65 5.84
HM911245/ HM911210	60.325 2.3750	130.175 5.1250	36.512 1.4375	33.338 1.3125	23.812 0.9375	156000 35000	186000 42000	2700	3600	2.12 4.67
HM911245/ HM911216	60.325 2.3750	134.983 5.3143	35.862 1.4119	33.338 1.3125	21.948 0.8641	156000 35000	186000 4200	2700	3600	2.25 4.96
392 394A	61.912 2.4375	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.879 1.94
H715334/ H715311	61.912 2.4375	136.525 5.3750	46.038 1.8125	46.038 1.8125	36.512 1.4375	224000 50500	355000 80000	2600	3500	3.47 7.65
H913842/ H913810	61.912 2.4375	146.050 5.7500	41.275 1.6250	39.688 1.5625	25.400 1.0000	199000 44500	234000 52500	2400	3200	3.17 6.99
28990/ 28920	61.976 2.4400	101.600 4.0000	24.608 0.9688	24.608 0.9688	19.845 0.7813	905000 20300	134000 3000	3500	4700	0.768 1.69
28995/ 28920	62.738 2.4700	101.600 4.0000	25.400 1.0000	25.400 1.0000	19.845 0.7813	905000 20300	134000 3000	3500	4700	0.764 1.68
L610549/ L610510	63.500 2.5000	94.458 3.7188	19.050 0.7500	19.050 0.7500	15.083 0.5938	60500 13600	103000 23100	3600	4800	0.449 0.990
29585/ 29520	63.500 2.5000	107.950 4.2500	25.400 1.0000	25.400 1.0000	19.050 0.7500	91500 20600	140000 31500	3200	4300	0.924 2.04
29585/ 29522	63.500 2.5000	107.950 4.2500	25.400 1.0000	25.400 1.0000	19.050 0.7500	91500 20600	140000 31500	3200	4300	0.931 2.05
29586/ 29520	63.500 2.5000	107.950 4.2500	25.400 1.0000	25.400 1.0000	19.050 0.7500	91500 20600	140000 31500	3200	4300	0.929 2.05
390A/ 394A	63.500 2.5000	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.851 1.88
390A/ 394AS	63.500 2.5000	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 2700	3200	4300	0.845 1.86
395/ 394A	63.500 2.5000	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.847 1.87
29585/ 29521	63.500 2.5000	110.000 4.3307	25.400 1.0000	25.400 1.0000	19.050 0.7500	91500 20600	140000 31500	3200	4300	0.982 2.17
3982/ 3920	63.500 2.5000	112.712 4.4375	30.162 1.1875	30.048 1.1830	23.812 0.9375	119000 26800	174000 39000	3200	4300	1.26 2.78
39585/ 39520	63.500 2.5000	112.712 4.4375	30.162 1.1875	30.162 1.1875	23.812 0.9375	138000 31000	195000 43500	3200	4200	1.27 2.80
39585A/ 39520	63.500 2.5000	112.712 4.4375	30.162 1.1875	30.162 1.1875	23.812 0.9375	138000 31000	195000 43500	3200	4200	1.28 2.82
477/ 472	63.500 2.5000	120.000 4.7244	29.794 1.1730	29.007 1.1420	24.237 0.9542	128000 28700	177000 40000	3000	4000	1.49 3.29
483/ 472	63.500 2.5000	120.000 4.7244	29.794 1.1730	29.007 1.1420	24.237 0.9542	128000 28700	177000 40000	3000	4000	1.48 3.26
HM212046/ HM212011	63.500 2.5000	122.238 4.8125	38.100 1.5000	38.354 1.5100	29.718 1.1700	187000 42000	244000 55000	3100	4100	1.95 4.30
HM212047/ HM212011	63.500 2.5000	122.238 4.8125	38.100 1.5000	38.354 1.5100	29.718 1.1700	187000 42000	244000 55000	3100	4100	1.94 4.28
5584/ 5535	63.500 2.5000	122.238 4.8125	43.658 1.7188	43.764 1.7230	36.512 1.4375	194000 43500	283000 63500	3100	4100	2.34 5.16
559/ 552A	63.500 2.5000	123.825 4.8750	38.100 1.5000	36.678 1.4440	30.162 1.1875	158000 35500	216000 48500	3000	4100	2.01 4.43
565/ 563	63.500 2.5000	127.000 5.0000	36.51 1.4375	36.170 1.4240	28.575 1.1250	163000 36500	229000 51500	2900	3800	2.11 4.65
HM813842/ HM813810	63.500 2.5000	127.000 5.0000	36.512 1.4375	36.512 1.4375	26.988 1.0625	163000 36500	22800 51500	2900	3800	2.12 4.67
639/ 632	63.500 2.5000	136.525 5.3750	41.275 1.6250	41.275 1.6250	31.750 1.2500	194000 43500	26200 59000	2800	3800	2.85 6.28
78250/ 78551	63.500 2.5000	140.030 5.5130	36.51 1.4375	33236 1.3085	23.520 0.9260	171000 38500	21200 47500	2600	3400	2.54 5.60
JLM710949/ JLM710910	65.000 2.5591	105.000 4.1339	24.000 0.9449	23.000 0.9055	18.500 0.7283	85000 19200	11700 26200	3300	4500	0.742 1.64
JM511946/ JM511910	65.000 2.5591	110.000 4.3307	28.000 1.1024	28.000 1.1024	22.500 0.8858	119000 26800	17400 39000	3200	4300	1.08 2.38
JH211749/ JH211710	65.000 2.5591	120.000 4.7244	39.000 1.5354	38.500 1.5157	32.000 1.2598	185000 41500	248000 55500	3100	4100	1.90 4.19
6379/ 6320	65.088 2.5625	135.755 5.3447	53.975 2.1250	56.007 2.2050	44.450 1.7500	278000 62500	380000 8500	2900	3800	3.71 8.18

Single Row (Inch) d 66.675~69.952mm 2.6250~2.7540inch

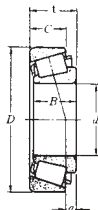


Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
L812148/ L812111	66.675 2.6250	103.213 4.0635	17.602 0.6930	17.602 0.6930	11.989 0.4720	60000 13400	78000 17600	3300	4400	0.480 1.06
29590/ 29520	66.675 2.6250	107.950 4.2500	25.400 1.0000	25.400 1.0000	19.050 0.7500	91500 20600	14000 31500	3200	4300	0.860 1.90
395A/ 394A	66.675 2.6250	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.796 1.76
395S/ 394A	66.675 2.6250	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.791 1.74
398A/ 3920	66.675 2.6250	112.712 4.4375	30.162 1.1875	30.048 1.1830	23.812 0.9375	119000 26800	174000 39000	3200	4300	1.18 2.60
398A/ 3925	66.675 2.6250	112.712 4.4375	30.162 1.1875	30.048 1.1830	23.812 0.9375	119000 26800	174000 39000	3200	4300	1.19 2.62
399A/ 3920	66.675 2.6250	112.712 4.4375	30.162 1.1875	30.048 1.1830	23.812 0.9375	119000 26800	174000 39000	3200	4300	1.18 2.60
39590/ 39520	66.675 2.26250	112.712 4.4375	30.162 1.1875	30.162 1.1875	23.812 0.9375	138000 31000	195000 43500	3200	4200	1.19 2.62
HM212049/ HM212010	66.675 2.6250	122.238 4.8105	38.100 1.5000	38.354 1.5100	29.718 1.1700	178000 42000	244000 5500	3100	4100	1.86 4.10
HM212049/ HM212011	66.675 2.6250	122.238 4.8125	38.100 1.5000	38.354 1.5100	29.718 1.1700	187000 42000	244000 55000	3100	4100	1.85 4.08
560/ 552A	66.675 2.6250	123.825 4.8750	38.100 1.5000	36.678 1.4440	30.162 1.1875	158000 35500	216000 48500	3000	4100	1.92 4.23
HM813844/ HM813810	66.675 2.6250	127.000 5.0000	36.512 1.4375	36.510 1.4375	26.988 1.0625	163000 36500	228000 51500	2900	3800	2.03 4.48
641/ 633	66.675 2.6250	130.175 5.1250	41.275 1.6250	41.275 1.6250	31.750 1.2500	194000 43500	26200 59000	2800	3800	2.41 5.31
6386/ 6320	66.675 2.6250	135.755 5.3447	53.975 2.1250	56.007 2.2050	44.450 1.7500	278000 62500	380000 85000	2900	3800	3.64 8.03
6389/ 6320	66.675 2.6250	135.755 5.3447	53.975 2.1250	56.007 2.2050	44.450 1.7500	278000 62500	380000 85000	2900	3800	3.63 8.00
641/ 632	66.675 2.6250	136.525 5.3750	41.275 1.6250	41.275 1.6250	31.750 1.2500	194000 43500	262000 59000	2800	3800	2.74 6.04
H414242/ H414210	66.675 2.6250	136.525 5.3750	41.275 1.6250	41.275 1.6250	31.750 1.2500	226000 51000	293000 66000	2700	3700	2.75 6.06
399A/ 394A	68.262 2.6875	110.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.764 1.68
399AS/ 394A	68.262 2.6875	11.000 4.3307	22.000 0.8661	21.996 0.8660	18.824 0.7411	89500 20100	120000 27000	3200	4300	0.756 1.67
480/ 472	68.262 2.6875	120.000 4.7244	29.794 1.1730	29.007 1.1420	24.237 0.9542	128000 28700	177000 4000	3000	4000	1.37 3.02
560S/ 552A	68.262 2.6875	123.825 4.5750	38.100 1.5000	36.678 1.4440	30.162 1.1875	158000 35500	216000 48500	3000	4100	1.87 4.12
H414245/ H414210	68.262 2.6875	136.525 5.3750	41.275 1.6250	41.275 1.6250	31.750 1.2500	226000 51000	293000 66000	2700	3700	2.70 5.95
H715343/ H715311	68.262 2.6875	136.525 5.3750	46.038 1.8125	46.038 1.812	36.512 1.4375	224000 50500	355000 80000	2600	3500	3.24 7.14
29675/ 29620	69.850 2.7500	112.712 4.4375	25.400 1.0000	25.400 1.0000	19.050 0.7500	95500 21500	151000 34000	3100	4100	0.949 2.09
33275/ 33462	69.850 2.7500	117.475 4.6250	30.162 1.1875	30.162 1.1875	23.812 0.9375	117000 26200	175000 39500	3000	4000	1.28 2.82
482/ 472A	69.850 2.7500	120.000 4.7244	29.002 1.1418	29.007 1.1420	23.444 0.9230	128000 28700	177000 40000	3000	4000	1.30 2.87
482/ 472	69.850 2.7500	120.000 4.7244	29.794 1.1730	29.007 1.1420	24.237 0.9542	128000 28700	177000 40000	3000	4000	1.33 2.93
47487/ 47420	69.850 2.7500	120.000 4.7244	32.545 1.2813	32.545 1.2813	26.195 1.0313	147000 33000	214000 48000	3000	4000	1.47 3.24
29675/ 29630	69.850 2.7500	120.650 4.7500	25.400 1.0000	25.400 1.000	19.050 0.7500	95500 21500	151000 3400	3100	4100	1.17 2.58
566/ 563	69.850 2.7500	127.000 5.0000	36.512 1.4375	36.170 1.424	28.575 1.1250	163000 36500	229000 51500	2900	3800	1.92 4.23
643/ 632	69.850 2.7500	136.525 5.3750	41.275 1.6250	41.275 1.625	31.750 1.2500	194000 43500	26200 59000	2800	3800	2.63 5.80
655/ 653	69.850 2.7500	146.050 5.7500	41.275 1.6250	41.275 1.6250	31.750 1.2500	206000 46500	295000 66500	2500	3300	3.28 7.23
745A/ 742	69.850 2.7500	150.089 5.9090	44.450 1.7500	46.672 1.8375	36.512 1.4375	261000 58500	360000 81000	2400	3200	3.92 8.64
835/ 832	69.850 2.7500	168.275 6.250	53.975 2.1250	56.363 2.2190	41.275 1.6250	340000 76000	460000 103000	2200	3000	6.13 13.5
34274/ 34478	69.952 2.7540	121.442 4.7812	24.608 0.9688	23.012 0.9060	17.462 0.6875	91000 20500	127000 28600	2900	3800	1.11 2.45
34274/ 34492A	69.952 2.7540	125.052 4.9233	23.731 0.9343	23.012 0.9060	16.400 0.6457	91000 20500	127000 28600	2900	3800	1.18 2.60

Single Row (Inch) d 70.000~76.200mm 2.7559~3.0000inch



Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
JLM81349/ JLM813010	70.000 2.7559	110.000 4.3307	26.000 1.0236	25.000 0.9843	20.5000 0.8071	97000 21800	150000 33500	3200	4200	0.889 1.96
JM612940/ JM612910	70.000 2.7559	115.000 4.5276	29.000 1.1417	29.000 1.1417	23.000 0.9055	124000 28000	171000 38500	3100	4100	1.13 2.49
484/ 472	70.000 2.7559	120.000 4.7244	29.794 1.1730	29.007 1.1420	24.237 0.9542	128000 28700	177000 40000	3000	4000	1.33 2.93
JH913848/ JH913811	70.000 2.7559	150.000 5.9055	41.275 1.6250	39.688 1.5625	25.400 1.0000	199000 445000	234000 52500	2400	3200	6.08 6.79
33281/ 33462	71.438 2.8125	117.475 4.6250	30.162 1.1875	30.162 1.1875	23.812 0.9375	117000 26200	175000 39500	3000	4000	1.24 2.73
47490 47420	71.438 2.8125	120.000 4.7244	32.545 1.2813	32.545 1.2813	26.195 1.0313	14700 33000	214000 48000	3000	4000	1.42 3.13
567A/ 563	71.438 2.8125	127.000 5.0000	36.512 1.4375	36.170 1.4240	28.575 1.1250	163000 36500	229000 51500	2900	3800	1.87 4.12
644/ 632	71.438 2.8125	136.525 5.3750	41.275 1.6250	41.275 1.6250	31.750 1.2500	194000 43500	262000 59000	2800	3800	2.57 5.67
H414249/ H414210	71.438 2.8125	136.525 5.3750	41.275 1.6250	41.275 1.625	31.750 01.2500	226000 51000	293000 66000	2700	3700	2.58 5.69
H715345/ H715311	71.438 2.8125	136.525 5.3750	46.038 1.8125	46.038 1.812	36.512 51.4375	224000 50500	355000 80000	2600	3500	3.11 6.86
29685/ 29620	73.025 2.8750	112.712 4.4375	25.400 1.0000	25.400 1.0000	19.050 0.7500	95500 211500	151000 34000	3100	4100	0.873 1.93
33287/ 33462	73.025 2.875	117.475 4.6250	30.162 1.1875	30.162 1.1875	23.812 0.9375	11700 26200	175000 39500	3000	4000	1.19 2.62
33287/ 33472	73.025 2.8750	120.000 4.7244	29.794 1.1730	30.162 1.1875	23.444 0.9230	11700 26200	175000 39500	3000	4000	1.28 2.82
567/ 563	73.025 2.8750	127.000 5.000	36.512 1.4375	36.170 1.4240	28.575 1.1250	163000 36500	229000 51500	2900	3800	1.82 4.01
576/ 572	73.025 2.8750	139.992 5.5115	36.512 1.4375	36.098 1.4212	28.575 1.1250	178000 40000	265000 59500	2600	3400	2.53 5.58
4640/ 6420	73.025 2.8750	149.225 5.8750	53.975 2.1250	54.229 2.1350	44.450 1.7500	287000 64500	410000 92000	2500	3400	4.42 9.74
744/ 742	73.025 2.8750	150.089 5.9090	44.45 1.7500	046.672 1.8375	36.512 1.4375	261000 58500	396000 81000	2400	3200	3.79 8.36
29688/ 29620	73.817 2.9062	112.712 4.4375	25.400 1.0000	25.400 1.0000	19.050 0.7500	95500 21500	151000 34000	3100	4100	0.860 1.90
568/ 563	73.817 2.9062	127.000 5.0000	36.512 1.4375	36.170 1.4240	28.575 1.1250	163000 36500	229000 51500	2900	3800	1.80 3.97
577/ 572	74.612 2.9375	139.992 5.5515	36.512 1.4375	36.098 1.4212	28.575 1.1250	178000 40000	265000 59500	2600	3400	2.48 5.47
JLM714149/ JLM714110	75.000 2.9528	115.000 4.5276	25.000 0.9843	25.000 0.9843	19.000 0.7480	94500 21300	143000 3200	3000	4000	0.875 1.93
JM714249/ JM714210	75.000 2.9528	120.000 4.7244	31.000 1.2205	29.500 1.1614	25.000 0.9843	131000 29400	197000 44500	2900	3900	1.29 2.84
JH415647/ JH415610	75.000 2.9528	145.000 5.7087	51.000 2.0079	51.000 2.0079	42.000 1.6535	287000 64500	410000 92000	2500	3400	3.81 8.40
L814749/ L814710	79.200 3.0000	109.538 4.3125	19.050 0.7500	19.050 0.7500	15.083 0.5938	63000 14200	115000 25800	3100	4100	0.579 1.28
34300/ 34478	76.200 3.0000	121.442 4.7812	24.608 0.9688	23.012 0.9060	17.462 0.6875	91000 20500	127000 286000	2900	3800	0.982 2.17
34301/ 34478	76.200 3.0000	121.442 4.7812	24.608 0.9688	23.012 0.9060	17.462 0.6875	91000 20500	127000 286000	2900	3800	0.977 2.15
42687/ 46260	76.200 3.0000	127.000 5.0000	30.162 1.1875	31.000 1.2205	22.225 0.8750	135000 30500	194000 43500	2800	3700	1.46 3.22
42688/ 42620	76.200 3.0000	127.000 5.000	30.162 1.1875	31.000 1.2205	22.225 0.8750	135000 30500	194000 43500	2800	3700	1.44 3.18
47678/ 47620	76.200 3.0000	133.350 5.2500	33.338 1.3125	33.338 1.3125	26.195 1.0313	153000 34500	235000 53000	2600	3500	1.92 4.23
47679/ 47620	76.200 3.0000	133.350 5.2500	33.338 1.3125	33.338 1.3125	26.195 1.0313	153000 34500	235000 5300	2600	3500	1.93 4.26
47680/ 47620	76.200 3.0000	133.350 5.2500	33.338 1.3125	33.338 1.3125	26.195 1.0313	153000 34500	235000 53000	2600	3500	1.94 4.28
HM516442/ HM516410	796.200 3.0000	133.350 5.2500	39.688 1.5625	39.688 1.5625	32.545 1.2813	177000 40000	305000 68000	2600	3500	2.43 5.36
5760/ 5735	76.200 3.0000	135.733 5.3438	44.450 1.7500	46.100 1.8150	34.925 1.3750	211000 47500	33000 74500	2700	3500	2.75 6.06
495A/ 493	76.200 3.0000	136.525 5.3750	30.162 1.1875	29.769 1.1720	22.225 0.8750	129000 29000	189000 42500	2600	3500	1.83 4.03
495AX/ 493	76.200 3.0000	136.525 5.3750	30.162 1.1878	29.769 1.1720	2.225 0.8750	129000 29000	189000 42500	2600	3500	1.82 4.01



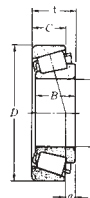
Single Row (Inch)

d 76.200~82.550mm

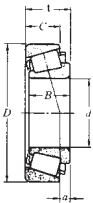
3.0000~3.2500inch

Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf	rev/min			
	d	D	t	B	C		Cr	Cor	Grease	
575/ 572	76.200 3.0000	139.992 5.5115	36.512 1.4375	36.098 1.4212	28.575 1.1250	178000 40000	265000 549500	2600	3400	2.43 5.36
575S/ 572	76.200 3.0000	139.992 5.5115	36.51 1.4375	36.098 1.4212	28.575 1.1250	178000 40000	265000 59500	2600	3400	2.41 5.31
659/ 653	76.200 3.0000	146.050 5.7500	41.275 1.6250	41.275 1.6250	31.750 1.2500	206000 46500	295000 66500	2500	3300	3.04 6.70
6461/ 6420	76.200 3.0000	149.225 5.8750	53.975 2.1250	54.229 2.1350	44.450 1.7500	287000 64500	410000 92000	2500	3400	4.26 9.39
6461A/ 6420	76.200 3.000	149.225 5.8750	53.975 2.1250	54.229 2.1350	44.450 1.7500	287000 64500	410000 92000	2500	3400	4.23 9.33
748S/ 742	76.200 3.0000	150.089 5.9090	44.450 1.7500	46.672 1.8375	36.51 1.4375	261000 58500	360000 81000	2400	3200	3.66 8.07
6576/ 6535	76.200 3.000	161.925 6.3750	53.975 2.1250	55.100 2.1693	42.862 1.6875	310000 69000	460000 104000	2300	3000	5.44 12.0
H917840/ H917840	76.200 3.0000	180.975 7.1250	53.975 2.1250	53.183 2.0938	53.720 1.4063	325000 725000	415000 93500	1900	2600	6.57 14.5
HH221430/ HH221410	76.200 3.0000	190.500 7.500	57.150 2.2500	57.531 2.2650	46.038 1.8125	445000 99500	610000 137000	1900	2600	8.69 19.2
LM814849/ LM814810	77.788 3.0625	117.475 4.6250	25.400 1.0000	25.400 1.000	19.050 0.7500	99500 22400	162000 36500	2900	3900	0.932 2.06
34306/ 34478	77.788 3.0625	121.442 4.7812	24.608 0.9688	23.012 0.9060	17.462 0.6875	91000 20500	127000 28600	2900	3800	0.943 2.08
34307/ 34478	77.788 3.0625	121.442 4.7812	24.608 0.9688	23.012 0.9060	23.012 0.6875	17.462 20500	91000 28600	2900	3800	0.930 2.05
42690/ 42620	77.788 3.0625	127.000 5.0000	30.162 1.1875	31.000 1.2205	22.225 0.8750	135000 30500	194000 43500	2800	3700	1.41 3.11
495AS/ 493	77.788 3.0625	136.525 5.3750	30.162 1.1875	26.769 1.1720	22.225 0.8750	129000 29000	189000 42500	2600	3500	1.78 3.92
H715348/ H715311	77.788 3.0625	136.525 5.3750	46.038 1.8125	46.038 1.812	36.512 1.4375	224000 50500	355000 80000	2600	3500	2.84 6.26
661/ 653	79.375 3.1250	146.050 5.7500	41.275 1.6250	41.275 1.6250	31.750 1.2500	206000 46500	295000 66500	2500	3300	2.91 6.42
756A/ 752	79.375 3.1250	161.925 6.3750	47.625 1.8750	48.260 1.9000	38.100 1.5000	270000 60500	385000 86500	2300	3100	4.55 10.0
HH221431/ HH221410	79.375 3.1250	190.500 7.5000	57.150 2.2500	57.531 2.2650	46.038 1.8125	445000 99500	610000 137000	1900	2600	8.52 18.8
JM515649/ JM515610	80.000 3.1496	130.000 5.1181	35.000 1.3780	34.000 1.3386	28.500 1.1220	166000 37500	249000 56000	2700	3600	1.73 3.81
47681/ 47620	80.962 3.1875	133.350 5.2500	33.338 1.3125	33.338 1.3125	26.195 1.0313	153000 34500	235000 5300	2600	3500	1.78 3.92
496/ 493	80.962 3.1875	136.525 5.3750	30.162 1.1875	29.769 1.1720	22.225 0.8750	129000 29000	189000 42500	2600	3500	1.69 3.75
581/ 572	80.962 3.1875	139.992 5.5115	36.512 1.4375	36.098 1.4212	28.575 1.1250	178000 40000	265000 59500	2600	3400	2.26 4.98
740/ 742	80.962 3.1875	150.089 5.9090	44.450 1.7500	46.672 1.8375	36.51 1.4375	261000 58500	360000 81000	2400	3200	3.43 7.56
27687/ 27620	82.550 3.2500	125.412 4.9375	25.400 1.0000	25.400 1.000	19845 0.7813	102000 22900	163000 36500	2700	3600	1.07 2.36
47686/ 47620	82.550 3.2500	133.350 5.2500	33.338 1.3125	33.338 1.3125	26.195 1.0313	153000 34500	235000 53000	2600	3500	1.72 3.79
47686/ 47620A	82.550 3.2500	133.350 5.2500	33.338 1.3125	33.338 1.3125	26.195 1.0313	153000 34500	235000 53000	2600	3500	1.73 3.81
47687/ 47620	82.550 3.2500	133.350 5.2500	33.338 1.3125	33.338 1.3125	26.195 1.0313	153000 34500	235000 53000	2600	3500	1.71 3.77
HM516448/ HM516410	82.550 3.2500	133.350 5.2500	39.688 1.5625	39.688 1.5625	32.545 1.2813	177000 40000	305000 68000	2600	3500	2.16 4.76
HM516449/ HM516410	82.550 3.2500	133.350 5.2500	39.688 1.5625	39.688 1.5625	32.545 1.2813	177000 40000	305000 68000	2600	3500	2.18 4.81
495/ 493	82.550 3.2500	136.525 5.3750	30.162 1.1875	29.769 1.1720	22.225 0.8750	129000 29000	189000 42500	2600	3500	1.64 3.62
580/ 572	82.550 3.2500	139.992 5.5115	36.512 1.4375	36.098 1.4212	28.575 1.1250	178000 40000	265000 59500	2600	3400	2.20 4.85
582/ 572	82.550 3.2500	139.992 5.5115	36.512 1.4375	36.098 1.4212	28.575 1.1250	178000 40000	265000 59500	2600	3400	2.19 4.83
663/ 653	82.550 3.2500	146.050 5.7500	41.275 1.6250	41.275 1.6250	31.750 1.2500	206000 465000	295000 66500	2500	3300	2.78 6.13
749A/ 742	82.550 3.2500	150.089 5.9090	44.450 1.7500	46.672 1.8375	36.512 1.4375	261000 58500	360000 81000	2400	3200	3.37 7.43
595/ 592A	82.550 3.2500	152.400 6.0000	36.688 1.5625	36.322 1.4300	30.162 1.1875	180000 40500	279000 62500	2300	3100	3.02 6.66

Single Row (Inch) d 82.550~90.000mm 3.2500~3.5433inch



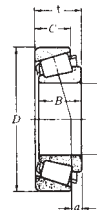
Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
663/ 652	82.550 3.2500	152.400 6.000	41.275 1.6250	41.275 1.6250	31.750 1.2500	206000 46500	295000 66500	2500	3300	3.15 6.94
757/ 752	82.550 3.2500	161.925 6.3750	47.625 1.8750	48.260 1.9000	38.100 1.5000	270000 60500	385000 86500	2300	3100	4.42 9.74
6559C/ 6535	82.550 3.2500	161.925 6.3750	53.975 2.1250	55.100 2.1693	42.862 1.6875	310000 69000	460000 104000	2300	3000	5.09 11.2
842/ 832	82.550 3.2500	168.275 6.6250	53.975 2.1250	56.363 2.2190	41.275 1.6250	340000 76000	460000 103000	2200	3000	5.46 12.0
27689/ 27620	83.345 3.2813	125.412 4.9375	25.400 1.0000	25.400 1.000	19.84 0.7813	102000 22900	163000 36500	2700	3600	1.06 2.34
27690/ 27620	83.345 3.2813	125.412 4.9375	25.400 1.0000	25.400 1.0000	19.845 0.7813	102000 22900	163000 36500	2700	3600	1.05 2.32
27691/ 27620	83.345 3.2813	125.412 4.9375	25.400 1.000	25.400 1.000	19.845 0.7813	102000 22900	163000 36500	2700	3600	1.04 2.29
498/ 493	84.138 3.3125	136.525 5.3750	30.162 1.1875	29.769 1.1720	22.225 0.8750	129000 29000	189000 42500	2600	3500	1.60 3.53
JM716648/ JM716610	88.000 3.3465	130.000 5.1181	30.000 1.1811	29.000 1.1417	24.000 0.9449	135000 30500	214000 48000	2600	3500	1.37 3.02
JM716649/ JM716610	85.000 3.3465	130.000 5.1181	30.000 1.1811	29.000 1.1417	24.000 0.9449	135000 30500	214000 48000	2600	3500	1.39 3.06
JHM516849/ JHM516810	85.000 3.3465	140.000 5.5118	39.000 1.5354	38.000 1.4961	31.500 1.2402	197000 44500	297000 67000	2500	3400	2.30 5.07
749/ 742	85.026 3.3475	150.089 5.9090	44.450 1.7500	46.672 1.8375	36.512 1.4375	261000 58500	260000 8100	2400	3200	3.25 7.17
749S/ 742	85.026 3.3475	150.089 5.9090	44.450 1.7500	46.672 1.8375	36.512 1.4375	261000 58500	360000 81000	2400	3200	3.24 7.14
497/ 492A	85.725 3.3750	133.350 5.2500	30.162 1.1875	29.769 1.1720	22.225 0.8750	129000 29000	189000 42500	2600	3500	1.43 3.15
497/ 493	85.725 3.3750	136.525 5.3750	30.162 1.1875	29.769 1.1720	22.225 0.8750	129000 29000	189000 42500	2600	3500	1.55 3.42
497A/ 493	85.725 3.3750	136.525 5.3750	30.162 1.1875	29.769 1.1720	22.225 0.8750	129000 29000	189000 42500	2600	3500	1.53 3.37
HM617049/ HM617010	85.725 3.3750	142.138 5.5960	42.862 1.6875	42.862 1.6875	34.133 1.3438	216000 48500	350000 78500	2500	3300	2.69 5.93
665/ 653	85.725 3.3750	146.050 5.7500	41.275 1.6250	41.275 1.6250	31.750 1.2500	206000 46500	295000 66500	2500	3300	2.65 5.84
665A/ 653	85.725 3.3750	146.050 5.7500	41.275 1.6250	41.275 1.6250	31.750 1.2500	206000 46500	295000 66500	2500	3300	2.63 5.80
596/ 592A	85.725 3.3750	152.400 6.0000	39.688 1.5625	36.322 1.4300	30.162 1.1875	180000 40500	279000 62500	2300	3100	2.90 6.39
758 752	85.725 3.3750	161.925 6.3750	47.625 1.8750	48.260 1.9000	38.100 1.5000	270000 60500	385000 86500	2300	3100	4.26 9.39
42346 42584	87.960 3.4630	148.430 5.8437	28.575 1.1250	28.971 1.1406	21.433 0.8438	138000 31000	215000 48500	2300	3100	1.99 4.39
LL217849/ LL217810	88.900 3.5000	121.442 4.7812	15.083 0.5938	15.083 0.5938	11.112 0.4375	56500 12700	88000 19800	2700	3600	0.452 0.996
L217849/ L217810	88.900 3.5000	123.825 4.8750	20.638 0.8125	20.638 0.8125	16.670 0.6563	80000 18000	141000 31500	2700	3500	0.737 1.63
42350/ 42584	88.900 3.5000	148.430 5.8437	28.575 1.1250	28.971 1.1406	21.433 0.8438	138000 31000	215000 48500	2300	3100	1.96 4.32
593/ 592A	88.900 3.5000	152.400 6.0000	39.688 1.5625	36.322 1.4300	30.162 1.1875	18000 40500	279000 62500	2300	3100	2.78 6.13
593A/ 592A	88.900 3.5000	152.400 6.0000	39.688 1.5625	36.322 1.4300	30.162 1.1875	180000 40500	279000 62500	2300	3100	2.76 6.09
759/ 752	88.900 3.5000	161.925 6.3750	47.625 1.8750	48.260 1.9000	38.100 1.5000	270000 60500	385000 86500	2300	3100	4.06 9.02
766/ 752	88.900 3.5000	161.925 6.3750	47.625 1.8750	48.260 1.9000	38.100 1.5000	270000 60500	385000 86500	2300	3100	4.07 8.97
6580/ 6535	88.900 3.5000	161.925 6.3750	53.975 2.1250	55.100 2.1693	42.862 1.6875	310000 69000	460000 104000	2300	3000	4.73 10.40
850/ 832	88.900 3.5000	168.275 6.2500	53.975 2.1250	56.363 2.2190	41.275 1.6250	340000 76000	460000 103000	2200	3000	5.08 11.20
HM218248/ HM21821	89.974 3.5423	146.975 5.7864	40.000 1.5748	40.000 1.5748	32.500 1.2795	227000 51000	340000 76500	2400	3200	2.55 2.62
JM718149/ JM718110	90.000 3.5433	145.000 5.7087	35.000 1.3780	34.000 1.3386	27.000 1.0630	189000 42500	27900 62500	2400	3200	2.14 4.72



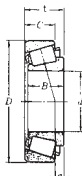
Single Row (Inch) **d 90.000~101.600mm** **3.5433~4.000inch**

Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
JHM318448/ JHM318410	90.000 3.5433	155.000 6.1024	44.000 1.7323	44.000 1.7323	35.500 1.3976	270000 60500	385000 86500	2300	3100	3.32 7.32
J90354/ J90748	90.000 3.5433	190.000 7.4803	50.800 2.0000	46.038 1.8125	31.750 1.2500	281000 63500	365000 82000	1800	2400	6.32 13.9
760/ 752	90.488 3.5625	161.925 6.3750	47.625 1.8750	48.260 1.9000	38.100 1.5000	270000 60500	385000 86500	2300	3100	4.01 8.84
47890/ 47820	92.075 3.6250	146.050 5.7500	33.338 1.3125	34.925 1.3750	26.195 1.0313	163000 37000	266000 59500	2400	3100	2.08 4.59
598/ 592A	92.075 3.6250	152.400 6.0000	39.688 1.5625	36.322 1.4300	30.162 1.1875	180000 40500	279000 62500	2300	3100	2.65 5.84
598A/ 592A	92.075 3.6250	152.400 6.0000	39.688 1.5625	36.322 1.4300	30.162 1.1875	180000 40500	279000 62500	2300	3100	2.63 5.80
681/ 672	92.075 3.6250	168.275 6.6250	41.275 1.6250	41.275 1.6250	30.162 1.1875	222000 50000	340000 77000	2100	2800	3.87 8.53
681A/ 672	92.075 3.6250	168.275 6.6250	41.275 1.6250	41.275 1.6250	30.162 1.1875	222000 50000	340000 77000	2100	2800	3.86 8.51
42368/ 42584	93.662 3.6875	148.430 5.8437	28.575 1.1250	28.971 1.1406	21.433 0.8438	138000 31000	215000 48500	2300	3100	1.80 3.97
JM719149/ JM719113	95.000 3.7402	150.000 5.9055	35.000 1.3780	34.000 1.3386	27.000 1.0630	180000 40500	278000 62500	2300	3100	2.19 4.83
L319249/ L319210	95.250 3.7500	130.175 5.1250	20.638 0.8125	21.433 0.8438	16.670 0.6536	81000 18300	147000 33000	2500	3300	0.789 1.74
47896/ 47820	95.250 3.7500	146.050 5.7500	33.338 1.3125	34.925 1.3750	26.195 1.0313	163000 37000	266000 59500	2400	3100	1.95 4.30
594A/ 592XE	95.250 3.7500	147.638 5.8125	35.717 1.4062	36.322 1.4300	26.192 1.0312	180000 40500	279000 62500	2300	3100	2.09 4.61
594A/ 592XS	95.250 3.7500	147.638 5.8125	35.717 1.4062	36.322 1.4300	26.192 1.0312	180000 40500	279000 62500	2300	3100	2.09 4.61
42375/ 42584	95.250 3.7500	148.430 5.8437	28.575 1.1250	28.971 1.1406	21.433 0.8438	138000 31000	215000 48500	2300	3100	1.75 3.86
594/ 592A	95.250 3.7500	152.400 6.0000	39.688 1.5625	36.322 1.4300	30.162 1.1875	180000 40500	279000 62500	2300	3100	2.51 5.53
594A/ 592A	95.250 3.7500	152.400 6.0000	39.688 1.5625	36.322 1.4300	30.162 1.1875	180000 40500	279000 62500	2300	3100	2.51 5.53
52375/ 52618	95.250 3.7500	157.162 6.1875	36.512 1.4375	36.116 1.4219	26.195 1.0313	188000 42000	305000 68000	2200	2900	2.76 6.09
683/ 672	95.250 3.7500	168.275 6.6250	41.275 1.6250	41.275 1.6250	30.162 1.1875	222000 50000	340000 77000	2100	2800	3.72 8.20
HH221440/ HH221410	95.250 3.7500	190.500 7.5000	57.150 2.2500	57.531 2.2650	46.038 1.8125	445000 99500	610000 13700	1900	2600	7.50 16.5
42381/ 42584	96.838 3.8125	148.430 5.8437	28.575 1.1250	28.971 1.1406	21.433 0.8428	138000 31000	215000 48500	2300	3100	1.69 3.73
90381/ 90744	96.838 3.8125	188.912 7.4375	50.800 2.0000	46.038 1.8125	31.750 1.2500	281000 63500	365000 82000	1800	2400	5.67 12.5
52387/ 52618	98.425 3.8750	157.162 6.1875	36.512 1.4375	36.116 1.4219	26.195 1.0313	188000 42000	305000 68000	2200	2900	2.62 5.78
685/ 672	98.425 3.8750	168.275 6.6250	41.275 1.6250	41.275 1.6250	30.162 1.1875	222000 50000	340000 77000	2100	2800	3.56 7.85
HH224334/ HH224310	99.974 3.9360	212.725 8.3750	66.675 2.6250	66.675 2.6250	53.975 2.1250	575000 129000	810000 182000	1700	2300	11.5 25.4
JM720249/ JM720210	100.000 3.9370	155.000 6.1024	36.000 1.4173	35.000 1.3780	28.000 1.1024	192000 43000	31000 69500	2200	2900	2.40 5.29
JHM720249/ JHM720210	100.000 3.9370	160.000 6.2992	41.000 1.6142	40.000 1.5748	32.000 1.2598	235000 53000	370000 83500	2200	2900	3.04 6.70
52393/ 52618	100.012 3.9375	157.162 6.1875	36.512 1.4375	36.116 1.4219	26.195 1.0313	188000 42000	305000 68000	2200	2900	2.55 5.62
52400/ 52618	101.600 4.0000	157.162 6.1875	36.512 1.4375	36.116 1.4219	26.195 1.0313	188000 42000	305000 68000	2200	2900	2.48 5.47
52400/ 52618	101.600 4.0000	161.925 6.3750	39.688 1.5625	36.116 1.4219	29.370 1.1563	188000 42000	305000 68000	2200	2900	2.89 6.37
687/ 672	101.600 4.0000	168.275 6.6250	41.275 1.6250	41.275 1.6250	30.162 1.1875	222000 50000	340000 77000	2100	2800	3.40 7.50
780/ 772	101.600 4.0000	180.975 7.1250	47.625 1.8750	48.006 1.8900	38.100 1.5000	285000 64000	430000 96500	2000	2700	5.11 11.3
861/ 854	101.600 4.0000	190.500 7.5000	57.150 2.2500	57.531 2.2650	44.450 1.7500	380000 855000	555000 124000	2000	2600	7.00 15.4

Single Row (Inch) d 101.600~127.000mm 4.0000~5.0000inch



Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
HH221449/ HH221410	101.600 4.0000	190.500 7.5000	57.150 2.2500	57.531 2.2650	46.038 1.8125	445000 99500	610000 137000	1900	2600	7.06 15.6
HH221449A/ HH221410	101.600 4.0000	190.500 7.5000	57.150 2.2500	57.531 2.2650	46.038 1.8125	445000 99500	610000 137000	1900	2600	7.06 15.6
941/ 932	101.600 4.0000	212.725 8.3750	66.675 2.6250	66.675 2.6250	53.975 2.1250	475000 107000	695000 156000	1800	2300	11.2 24.7
HH224335/ HH224310	101.600 4.0000	212.725 8.3750	66.675 2.6250	66.675 2.6250	53.975 2.1250	575000 129000	810000 182000	1700	2300	11.3 24.9
782/ 772	104.775 4.1250	180.975 7.1250	47.625 1.8750	48.006 1.8900	38.100 1.5000	285000 64000	430000 96500	2000	2700	4.92 10.8
786/ 772	104.775 4.1250	180.975 7.1250	47.625 1.8750	48.006 1.8900	38.100 1.5000	285000 64000	430000 96500	2000	2700	4.90 10.8
787/ 772	104.775 4.1250	180.975 7.1250	47.625 1.8750	48.006 1.8900	38.100 1.5000	285000 64000	430000 96500	2000	2700	4.90 10.8
37425/ 37625	107.950 4.2500	158.750 6.2500	23.020 0.9063	21.438 0.8440	15.875 0.6250	102000 23000	166000 37500	2100	2800	1.37 3.02
M522546/ M522510	107.950 4.2500	159.987 6.2987	34.925 1.3750	34.925 1.3750	26.988 1.0625	167000 375000	320000 72500	2100	2800	2.37 5.23
56425/ 56650	107.950 4.2500	165.100 6.5000	36.51 1.4375	36.512 1.4375	26.988 1.0625	191000 43000	315000 70500	2100	2700	2.69 5.93
56425/ 56662	107.950 4.2500	168.275 6.6250	36.512 1.4375	36.512 1.4375	26.988 1.0625	191000 43000	315000 70500	2100	2700	2.87 6.33
936/ 932	107.950 4.2500	212.725 8.3750	66.675 2.6250	66.675 2.6250	53.975 2.1250	475000 107000	695000 156000	1800	2300	10.7 23.6
37431/ 37625	109.538 4.3125	158.750 6.2500	23.020 0.9063	21.438 0.8440	15.875 0.6250	102000 23000	166000 37500	2100	2800	1.33 2.93
LM522548/ LM522510	109.987 4.3302	159.987 6.2987	34.925 1.3750	34.925 1.3750	26.988 1.0625	167000 37500	320000 72500	2100	2800	2.24 4.94
LM522549/ LM522510	109.987 4.3302	159.987 6.2987	34.925 1.3750	34.925 1.3750	26.988 1.0625	167000 37500	320000 72500	2100	2800	2.27 5.00
64433/ 64700	109.992 4.3304	177.800 7.0000	41.275 1.6250	41.275 1.6250	30.162 1.1875	232000 52000	375000 84000	1900	2600	3.77 8.31
JM822049/ JM822010	110.000 4.3307	165.000 6.4961	35.000 1.3780	35.000 1.3780	26.500 1.4033	191000 43000	315000 70500	2100	2700	2.52 5.56
JHM522649/ JHM522610	110.000 4.3307	180.000 7.0866	47.000 1.8504	46.000 1.8110	38.000 1.4961	305000 68500	480000 108000	1900	2600	4.61 10.2
H924045/ H924010	111.125 4.3750	214.312 8.4375	55.562 2.1875	52.388 2.0625	39.688 1.5625	405000 91000	560000 126000	1500	2000	8.18 18.0
64450/ 64700	114.300 4.5000	177.800 7.0000	41.275 1.6250	41.275 1.6250	30.162 1.1875	232000 52000	375000 84000	1900	2600	3.52 7.76
64450/ 64708	114.300 4.5000	179.974 7.0856	41.275 1.6250	41.275 1.6250	30.162 1.1875	232000 52000	375000 84000	1900	2600	3.67 8.09
68450/ 68712	114.300 4.5000	180.975 7.1250	34.925 1.3750	31.750 1.2500	25.400 1.0000	169000 38000	245000 55000	1900	2500	2.93 6.46
938/ 932	114.300 4.5000	212.725 8.3750	66.675 2.6250	66.675 2.6250	53.975 2.1250	475000 107000	695000 156000	1800	2300	10.1 22.3
HH224346/ HH224310	114.300 4.5000	212.725 8.3750	66.675 2.6250	66.675 2.6250	53.975 2.1250	575000 129000	810000 182000	1700	2300	10.2 22.5
HM926740/ HM926710	114.300 4.5000	228.600 9.0000	53.975 2.1250	49.428 1.9460	38.100 1.5000	430000 96500	620000 140000	1400	1900	9.76 21.5
71453/ 71750	115.087 4.531	190.500 7.5000	47.625 1.8750	49.212 1.9375	34.925 1.3750	300000 67500	475000 107000	1400	2500	5.11 11.3
71455/ 71750	115.087 4.5310	190.500 7.5000	47.625 1.8750	49.212 1.9375	34.925 1.3750	300000 67500	475000 107000	1800	2500	5.08 11.2
68462/ 68712	117.475 4.6250	180.975 7.1250	34.925 1.3750	31.750 1.2500	25.400 1.0000	169000 38000	245000 55000	1900	2500	2.78 6.13
JL724348/ JL724314	120.000 4.7244	170.000 6.6929	25.400 1.0000	25.400 1.0000	19.050 0.7500	127000 28600	210000 47000	2000	2600	1.67 3.68
95475/ 95925	120.650 4.7500	234.950 9.2500	63.500 2.5000	63.500 2.5000	49.212 1.9375	525000 118000	825000 185000	1500	2000	12.6 27.8
48286/ 48220	123.825 4.8750	182.562 7.1875	39.688 1.5625	38.100 1.5000	33.338 1.3125	224000 50500	435000 97500	1800	2400	3.52 7.76
48290/ 48220	127.000 5.0000	182.562 7.1875	39.688 1.5625	38.100 1.5000	33.338 1.3125	224000 50500	435000 97500	1800	2400	3.33 7.34



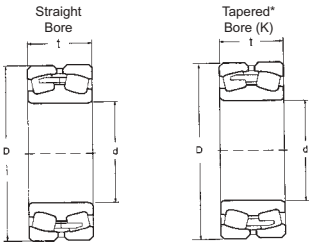
Single Row (Inch)

d 127.000~158.750mm

5.0000~6.2500inch

Bearing Number	Dimensions					Basic Load Ratings		Limiting Speeds		Weight kg lb
	mm inch					N lbf		rev/min		
	d	D	t	B	C	Cr	Cor	Grease	Oil	
67388/ 67322	127.000 5.0000	196.850 7.7500	46.038 1.8125	46.038 1.8125	38.100 1.5000	310000 69500	550000 124000	1700	2200	5.10 11.2
74500/ 74850	127.000 5.0000	215.900 8.5000	47.625 1.8750	47.625 1.8750	34.925 1.3750	320000 71500	540000 121000	1600	2100	7.05 15.5
97500/ 97900	127.000 5.0000	228.600 9.0000	53.975 2.1250	49.428 1.9460	38.100 1.5000	320000 72000	445000 99500	1400	1900	8.43 18.6
HM926747/ HM926710	127.000 5.0000	228.600 9.0000	53.975 2.1250	49.428 1.9460	38.100 1.5000	430000 96500	620000 140000	1400	1900	8.83 19.5
95500/ 95905	127.000 5.0000	230.000 9.0551	63.500 2.5000	63.500 2.5000	49.212 1.9375	525000 118000	825000 185000	1500	2000	12.9 28.4
95500/ 95925	127.000 5.0000	234.950 9.2500	63.500 2.5000	63.500 2.5000	49.212 1.9375	525000 118000	825000 185000	1500	2000	12.0 26.5
HH228349/ HH228310	127.000 5.0000	254.000 10.0000	77.788 3.0625	82.550 3.2500	61.912 2.4375	740000 166000	1070000 241000	1400	1900	19.5 43.0
799/ 792	128.588 5.0625	206.375 8.1250	47.625 1.8750	47.625 1.8750	34.925 1.3750	315000 70500	520000 116000	1700	2200	5.77 12.7
67389/ 67322	130.175 5.1250	196.850 7.7500	46.038 1.8125	46.038 1.8125	38.100 1.5000	310000 69500	550000 124000	1700	2200	4.87 10.7
799A/ 792	130.175 5.1250	206.375 8.1250	47.625 1.8750	47.625 1.8750	34.925 1.3750	315000 70500	520000 116000	1700	2200	5.65 12.5
L327249/ L327210	133.350 5.2500	177.008 6.9688	25.400 1.0000	26.195 1.0313	20.638 0.8125	126000 28400	259000 5800	1800	2400	1.70 3.75
48385/ 48320	133.350 5.2500	190.500 7.5000	39.688 1.5625	39.688 1.5625	33.338 1.3125	236000 53000	475000 107000	1700	2300	3.64 8.03
67390/ 67322	133.350 5.2500	196.850 7.7500	46.038 1.8125	46.038 1.8125	38.100 1.5000	310000 69500	550000 124000	1700	2200	4.63 10.2
67391/ 67322	133.350 5.2500	196.850 7.7500	46.038 1.8125	46.038 1.8125	38.100 1.5000	310000 69500	550000 124000	1700	2200	4.59 10.1
74525/ 74850	133.350 5.2500	215.900 8.5000	47.625 1.8750	47.625 1.8750	34.925 1.3750	320000 71500	540000 121000	1600	2100	6.56 14.5
95525/ 95925	133.350 5.2500	234.950 9.2500	63.500 2.5000	63.500 2.5000	49.212 1.9375	525000 118000	825000 185000	1500	2000	11.3 24.9
95528/ 95925	133.350 5.3750	234.950 9.2500	63.500 2.5000	63.500 2.5000	49.212 1.9375	525000 118000	825000 185000	1500	2000	11.4 25.1
48393/ 48320	136.525 5.3750	190.500 7.5000	39.688 1.5625	39.688 1.5625	33.338 1.3125	236000 53000	475000 107000	1700	2300	3.43 7.59
896/ 892	136.525 5.3750	228.600 9.0000	57.150 2.2500	57.150 2.2500	44.450 1.7500	445000 100000	735000 165000	1500	2000	9.07 20.0
74550/ 74845	139.700 5.5000	214.975 8.4636	47.625 1.8750	47.625 1.8750	34.925 1.3750	320000 71500	540000 121000	1600	2100	5.97 13.2
74550/ 74850	139.700 5.5000	215.900 8.5000	47.625 1.8750	47.625 1.8750	34.925 1.3750	320000 71500	540000 121000	1600	2100	6.05 13.3
898/ 892	139.700 5.5000	228.600 98.0000	57.150 2.2500	57.150 2.2500	44.450 1.7500	445000 100000	735000 165000	1500	2000	8.76 19.3
898A/ 892	139.700 5.5000	228.600 9.0000	57.150 2.2500	57.150 2.2500	44.450 1.7500	445000 100000	735000 165000	1500	2000	8.73 19.2
99550/ 99100	139.700 5.5000	254.000 10.0000	66.675 2.6250	66.675 2.6250	47.625 1.8750	550000 124000	910000 204000	1400	1800	14.3 31.5
48684/ 48620	142.875 5.6250	200.025 7.8750	41.275 1.6250	39.688 1.5625	34.130 1.3437	239000 53500	490000 110000	1600	2100	3.85 8.49
48685/ 48620	142.875 5.6250	200.025 7.8750	41.275 1.6250	39.688 1.5625	34.130 1.3437	239000 53500	490000 110000	1600	2100	3.89 8.58
36690/ 36620	146.050 5.7500	193.675 7.6250	28.575 1.1250	28.575 1.1250	23.020 0.9063	165000 37000	340000 77000	1600	2200	2.27 5.00
36691/ 36620	146.050 5.7500	193.675 7.6250	28.575 1.1250	28.575 1.1250	23.020 0.9063	165000 37000	340000 77000	1600	2200	2.25 4.96
99575/ 99100	146.050 5.7500	254.000 10.0000	66.675 2.6250	66.675 2.6250	47.625 1.8750	550000 124000	910000 204000	1400	1800	13.5 29.8
L630349/ L630310	152.400 6.0000	192.088 7.5625	25.000 0.9843	24.000 0.9449	19.000 0.7480	130000 29200	261000 59000	1600	2100	1.53 3.37
M231648/ M231610	152.400 6.0000	222.250 8.7500	46.830 1.8437	46.830 1.8437	34.925 1.3750	315000 71000	585000 132000	1500	2000	5.72 12.6
M231649/ M231610	152.400 6.0000	222.250 8.7500	46.830 1.8437	46.830 1.8437	34.925 1.3750	315000 71000	585000 132000	1500	2000	5.77 12.7
L432349/ L432310	158.750 6.2500	205.583 8.0938	23.812 0.9375	23.812 0.9375	18.258 0.7188	126000 28300	247000 55500	1500	2000	1.89 4.17

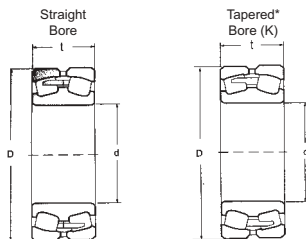
Spherical Roller Bearings
22200 Series



Tapered Roller Bearings

Bearing Number	Dimensions (mm)			Basic Load Ratings (kN)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Thickness t	<i>C_r</i>	<i>C_{or}</i>	Grease	Oil	
22206	30	62	20	33.50	38.2	5300	6700	0.287
22207	35	72	23	45.20	59.5	4800	6000	0.432
22208	40	80	23	49.80	68.50	4500	5600	0.555
22209	45	85	23	52.20	73.20	4000	5000	0.590
22210	50	90	23	57.20	73.20	3800	4800	0.692
22211	55	100	25	66.00	87.20	3400	4300	0.860
22212	60	110	28	89.98	122.00	3200	4000	1.198
22213	65	120	31	97.35	128.00	2800	3600	1.551
22214	70	125	31	104.50	142.00	2600	3400	1.660
22215	75	130	31	104.50	142.00	2400	3200	1.730
22216	80	140	33	126.50	180.00	2200	3000	2.280
22217	85	150	36	159.50	228	2000	2800	2.830
22218	90	160	40	184.80	272.00	1900	2600	4.010
22219	95	170	43	233.20	322.00	1800	2400	4.550
22220	100	180	46	244.20	358.00	1700	2200	5.124
22222	110	200	53	316.80	465.00	1500	1900	7.000
22224	120	215	58	376.20	565.00	1300	1700	9.070
22226	130	236	64	448.80	708.00	1200	1600	11.370
22228	140	250	68	525.80	805.00	1000	1400	14.200
22230	150	270	73	558.80	875.00	950	1300	18.420
22232	160	290	80	706.20	1140.00	900	1200	23.500
22234	170	310	86	792.00	1300.00	850	1100	28.800
22236	180	320	86	808.60	1370.00	800	1000	30.900
22238	190	340	92	899.80	1510.00	750	950	37.410
22240	200	360	98	1518.00	2640.00	750	1000	43.900

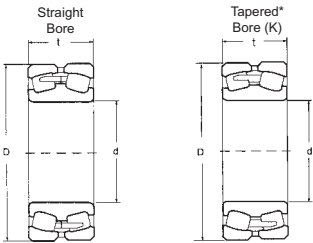
22300 Series



Bearing Number	Dimensions (mm)			Basic Load Ratings (kN)		Limiting Speeds (rev/min)		Weight kg
	Bore d	OD D	Thickness t	C_r	C_{or}	Grease	Oil	
22308	40	90	33	73.5	90.50	4000	5000	1.041
22309	45	100	36	108.0	140.00	3600	4500	1.387
22310	50	110	40	140.8	170.00	3400	4300	1.827
22311	55	120	43	170.5	198.00	3000	3800	2.299
22312	60	130	46	184.8	225.00	2800	3600	2.881
22313	65	140	48	206.8	252.00	2400	3200	3.494
22314	70	150	51	253.0	315.00	2200	3000	4.212
22315	75	160	55	288.2	388.00	2000	2800	5.225
22316	80	170	58	316.8	405.00	1900	2600	6.296
22317	85	180	60	338.8	440.00	1800	2400	7.360
22318	90	190	64	401.5	542.00	1700	2200	8.878
22139	95	200	67	423.5	570.00	1600	2000	10.380
22320	100	215	73	495.0	668.00	1400	1800	12.941
22322	110	240	80	599.5	832.00	1200	1600	17.850
22324	120	260	86	709.5	992.00	1100	1500	22.378
22326	130	280	93	794.2	1140.00	950	1300	28.130
22328	140	300	102	907.5	1340.00	900	1200	34.840
22330	150	320	108	1230.0	1600.00	1200	1500	43.600
22332	160	340	114	1380.0	1790.00	1100	1400	51.900
22334	170	360	120	1265.0	2060.00	750	950	60.750
22336	180	380	126	1386.0	2270.00	700	900	60.080
22338	190	400	132	1529.0	2530.00	670	850	83.220

* For Tapered bore bearings add Suffix 'K'

23000 Series

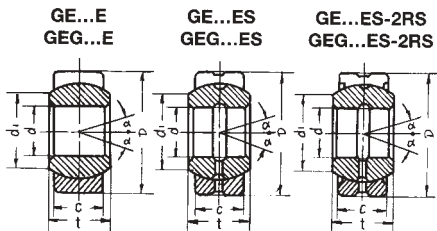


Bearing Number	Principal Dimensions (mm)			Basic Load Ratings (kN)		Limiting Speeds (rev/min)		Weight kg
	d	D	t	Cr	Cor	Grease	Oil	
23022	110	170	45	286	478	2100	2800	3.96
23024	120	180	46	299	517	1900	2600	4.35
23026	130	200	52	377	654	1700	2300	6.17
23028	140	210	53	428	737	1600	2200	6.87
23030	150	225	56	467	812	1500	2000	8.25
23032	160	240	60	539	944	1400	1900	10.2
23034	170	260	67	609	1110	1300	1700	13.4
23036	180	280	74	710	1290	1200	1600	17.6
23038	190	290	75	736	1370	1100	1500	18.8
23040	200	310	82	890	1670	1000	1400	24.10

23100 Series

23120	100	165	52	297	493	2200	3000	4.58
23122	110	180	56	346	591	2000	2700	5.76
23124	120	200	62	447	760	1800	2400	8.33
23128	140	225	68	561	934	1500	2100	10.80
23136	180	300	96	1000	1800	1100	1500	28.40
23140	200	340	112	1240	2250	980	1300	43.70
23144	220	370	120	1440	2700	880	1200	54.80

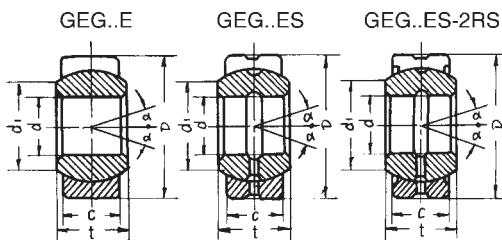
* For Tapered bore bearings add Suffix 'K'



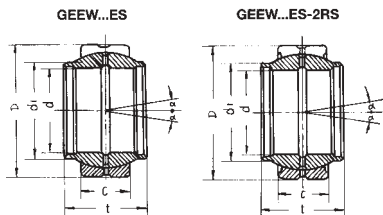
Spherical Plain Radial Bearings with Fitting Crack And Fitting Groove

Bearing Number		Dimensions (mm)					Basic Load Rating kN		α° ~	Weight kg
		d	D	t	C	d _{min}	Dynamic	Static		
GE4E	-----	4	12	5	3	6	2	10	16	0.003
GE5E	-----	5	14	6	4	7	3.4	17	13	0.005
GE6E	-----	6	14	6	4	8	3.4	17	13	0.004
GE8E	-----	8	16	8	5	10	5.5	27	15	0.008
GE10E	-----	10	19	9	6	13	8.1	40	12	0.011
GE12E	-----	12	22	10	7	15	10	54	10	0.015
GE15ES	GE15ES-2RS	15	26	12	9	18	17	85	8	0.027
GE17ES	GE17ES-2RS	17	30	14	10	20	21	106	10	0.041
GE20ES	GE20ES-2RS	20	35	16	12	24	30	146	9	0.066
GE25ES	GE25ES-2RS	25	42	20	16	29	48	240	7	0.119
GE30ES	GE30ES-2RS	30	47	22	18	34	62	310	6	0.513
GE35ES	GE35ES-2RS	35	55	25	20	39	80	400	6	0.233
GE40ES	GE40ES-2RS	40	62	28	22	45	100	500	7	0.306
GE45ES	GE45ES-2RS	45	68	32	25	50	127	640	7	0.427
GE50ES	GE50ES-2RS	50	75	35	28	55	156	780	6	0.546
GE60ES	GE60ES-2RS	60	90	44	36	66	245	1220	6	1.04
GE70ES	GE70ES-2RS	70	105	49	40	77	315	1560	6	1.55
GE80ES	GE80ES-2RS	80	120	55	45	88	400	2000	6	2.31
GE90ES	GE90ES-2RS	90	130	60	50	98	490	2450	5	2.75
GE100ES	GE100ES-2RS	100	150	70	55	109	610	3050	7	4.45
GE110ES	GE110ES-2RS	110	160	70	55	120	655	3250	6	4.82
GE120ES	GE120ES-2RS	120	180	85	70	130	950	4750	6	8.05
GE140ES	GE140ES-2RS	140	210	90	70	150	1080	5400	7	11.02
GE160ES	GE160ES-2RS	160	230	105	80	170	1370	6800	8	14.01
GE180ES	GE180ES-2RS	180	260	105	80	192	1530	7650	6	18.65
GE200ES	GE200ES-2RS	200	290	130	100	212	2120	10600	7	28.03
GE220ES	GE220ES-2RS	220	320	135	100	238	2320	11600	8	35.51
GE240ES	GE240ES-2RS	240	340	140	100	265	2550	12700	8	39.91
GE260ES	GE260ES-2RS	260	370	150	110	285	3050	15300	7	51.54
GE280ES	GE280ES-2RS	280	400	155	120	310	3550	18000	6	65.06
GE300ES	GE300ES-2RS	300	430	165	120	330	3800	19000	7	78.07

Medium (GE..) Series



Bearing Number		Dimensions (mm)					Basic Load Rating (kN)		α° ≈	Weight kg
		d	D	t	C	d _{1min}	Dynamic	Static		
GEG4E	-----	4	14	7	4	7	3.4	17	20	0.005
GEG5E	-----	5	16	9	5	8	5.5	27	21	0.008
GEG6E	-----	6	16	9	6	9	8.1	27	21	0.006
GEG8E	-----	8	19	11	6	11	8.1	40	21	0.014
GEG10E	-----	10	22	12	7	13	10	54	18	0.021
GEG12E	-----	12	26	15	9	16	17	85	18	0.033
GEG15ES	GEG15ES-2RS	15	30	16	10	19	21	106	16	0.049
GEG17ES	GEG17ES-2RS	17	35	20	12	21	30	146	19	0.083
GEG20ES	GEG20ES-2RS	20	42	25	16	24	48	240	17	0.153
GEG25ES	GEG25ES-2RS	25	47	28	18	29	62	310	17	0.203
GEG30ES	GEG30ES-2RS	30	55	32	20	34	80	400	17	0.304
GEG35ES	GEG35ES-2RS	35	62	35	22	39	100	500	16	0.408
GEG40ES	GEG40ES-2RS	40	68	40	25	44	127	640	17	0.542
GEG45ES	GEG45ES-2RS	45	75	43	28	50	156	780	15	0.713
GEG50ES	GEG50ES-2RS	50	90	56	36	57	245	1220	17	1.44
GEG60ES	GEG60ES-2RS	60	105	63	40	67	315	1560	17	1.60
GEG70ES	GEG70ES-2RS	70	120	70	45	77	400	2000	16	3.01
GEG80ES	GEG80ES-2RS	80	130	75	50	87	490	2450	14	3.64
GEG90ES	GEG90ES-2RS	90	150	85	55	98	610	3050	15	5.22
GEG100ES	GEG100ES-2RS	100	160	85	55	110	655	3250	14	6.05
GEG110ES	GEG110ES-2RS	110	180	100	70	122	950	4750	12	9.68
GEG120ES	GEG120ES-2RS	120	210	115	70	132	1080	5400	16	14.72
GEG140ES	GEG140ES-2RS	140	230	130	80	151	1370	6800	16	19.01
GEG160ES	GEG160ES-2RS	160	260	135	80	176	1530	7650	16	20.02
GEG180ES	GEG180ES-2RS	180	290	155	100	196	2120	10600	14	32.21
GEG200ES	GEG200ES-2RS	200	320	165	100	220	2320	11600	15	45.28
GEG220ES	GEG220ES-2RS	220	340	175	100	243	2550	12700	16	51.12
GEG240ES	GEG240ES-2RS	240	370	190	110	263	3050	15300	15	65.12
GEG260ES	GEG260ES-2RS	260	400	205	120	285	3550	18000	15	82.44
GEG280ES	GEG280ES-2RS	280	430	210	120	310	3800	19000	15	97.21

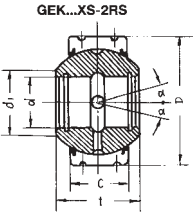


With Wide Inner Ring and Fitting Crack GEE...

Bearing Number		Dimensions mm					Basic Load Rating (kN)		α° =	Weight kg
		d	D	t	C	d_{fmin}	Dynamic	Static		
GEEW12ES*	GEEW12ES-2RS*	12	22	12	7	15.5	10	54	4	0.022
GEEW15ES	GEEW15ES-2RS	15	26	15	9	18.5	17	85	5	0.031
GEEW16ES	GEEW16ES-2RS	16	28	16	9	20	17	85	4	0.035
GEEW17ES	GEEW17ES-2RS	17	30	17	10	21	21	106	7	0.044
GEEW20ES	GEEW20ES-2RS	20	35	20	12	25	30	146	4	0.071
GEEW25ES	GEEW25ES-2RS	25	42	25	16	30.5	48	240	4	0.131
GEEW30ES	GEEW30ES-2RS	30	47	30	18	34	62	310	4	0.168
GEEW32ES	GEEW32ES-2RS	32	52	32	18	37	62	310	4	0.182
GEEW35ES	GEEW35ES-2RS	35	55	35	20	40	80	400	4	0.253
GEEW40ES	GEEW40ES-2RS	40	62	40	22	46	100	500	4	0.338
GEEW45ES	GEEW45ES-2RS	45	68	45	25	52	127	640	4	0.481
GEEW50ES	GEEW50ES-2RS	50	75	50	28	57	156	780	4	0.558
GEEW60ES	GEEW60ES-2RS	60	90	60	36	68	245	1220	3	1.15
GEEW63ES	GEEW63ES-2RS	63	95	65	36	71.5	245	1220	4	1.23
GEEW70ES	GEEW70ES-2RS	70	105	70	40	78	315	1560	4	1.71
GEEW80ES	GEEW80ES-2RS	80	120	80	45	91	400	2000	4	2.39
GEEW100ES	GEEW100ES-2RS	100	150	100	55	113	610	3050	4	4.80

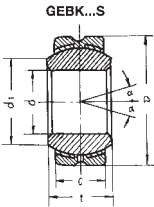
*A lubrication groove and holes in the outer ring only.

Two Piece With Two Seals
GEK..XS-2RS

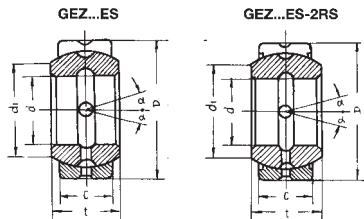


Bearing Number	Dimensions mm					Basic Load Rating kN		α°	Weight kg
	d	D	t	C	d _{1min}	Dynamic	Static	$\approx$	
GEK30XS-2RS	30	70	47	32	37.3	163	813	19	0.785
GEK35XS-2RS	35	80	54	38	443.5	226	1130	17	1.23
GEK40XS-2RS	40	90	64	44	48	298	1490	19	1.83
GEK45XS-2RS	45	100	72	52	54	398	1990	17	2.56
GEK50XS-2RS	50	110	80	58	60	493	2450	17	3.43
GEK55XS-2RS	55	125	90	64	63.2	598	2990	19	5.02
GEK60XS-2RS	60	135	98	72	69.3	732	3660	17	6.43

With Inlaid Liner
GEBK..S



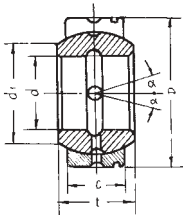
Bearing Number	Dimensions mm					Basic Load Rating kN		α°	Weight kg
	d	D	t	C	d _{1min}	Dynamic	Static	$\approx$	
GEBK5S	5	16	8	6	7.7	2.5	7.8	13	0.0085
GEBK6S	6	18	9	6.75	9	3.1	9.8	13	0.013
GEBK8S	8	22	12	9	10.4	5.7	16	14	0.024
GEBK10S	10	26	14	10.5	12.9	7.8	23	14	0.039
GEBK12S	12	30	16	12	15.4	10.2	31	13	0.058
GEBK14S	14	34	19	13.5	16.9	13.4	40	16	0.084
GEBK16S	16	38	21	15	19.4	16.4	50	15	0.111
GEBK18S	18	42	23	16.5	21.9	20.3	61	15	0.160
GEBK20S	20	46	25	18	24.4	24	73	15	0.21
GEBK22S	22	50	28	20	25.8	29	88	15	0.26
GEBK25S	25	56	31	22	29.6	36	110	15	0.39
GEBK30S	30	66	37	25	34.8	48	148	17	0.61



In Inch Dimensions With Fitting Crack GEZ..ES, GEZ..ES-2RS

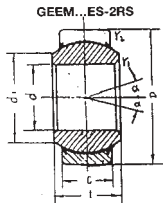
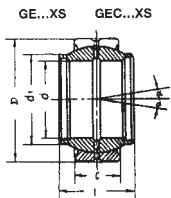
Bearing Number		Dimensions mm					Basic Load Rating (kN)		α° ≈	Weight kg
		d	D	t	C	d ₁ min	Dynamic	Static		
GEZ12ES	----	12.7	22.225	11.1	9.525	14.1	13.7	41.5	6	0.022
GEZ15ES	----	15.875	26.988	13.894	11.913	18.3	22.0	65.5	6	0.036
GEZ19ES	GEZ19ES-2RS	19.05	31.75	16.662	14.275	21.8	31.5	95.0	6	0.053
GEZ22ES	GEZ22ES-2RS	22.225	36.513	19.431	16.662	25.4	42.5	127	6	0.085
GEZ25ES	GEZ25ES-2RS	25.4	41.275	22.225	19.05	27.6	56.0	166	6	0.121
GEZ31ES	GEZ31ES-2RS	31.75	50.8	27.762	23.8	36.0	86.5	260	6	0.232
GEZ34ES	GEZ34ES-2RS	34.925	55.563	30.15	26.187	38.6	102	310	6	0.351
GEZ38ES	GEZ38ES-2RS	38.1	61.913	33.325	28.575	41.2	125	375	6	0.422
GEZ44ES	GEZ44ES-2RS	44.45	71.438	38.887	33.325	50.7	170	510	6	0.671
GEZ50ES	GEZ50ES-2RS	50.8	80.963	44.45	38.1	57.9	224	670	6	0.932
GEZ57ES	GEZ57ES-2RS	57.15	90.488	50.013	42.85	64.9	280	850	6	1.33
GEZ63ES	GEZ63ES-2RS	63.5	100.013	55.55	47.625	73.3	355	1060	6	1.85
GEZ69ES	GEZ69ES-2RS	69.85	111.125	61.112	52.375	79.1	415	1250	6	2.42
GEZ76ES	GEZ76ES-2RS	76.2	120.65	66.675	57.15	86.8	500	1500	6	3.10
GEZ82ES	GEZ82ES-2RS	82.55	130.175	72.238	61.9	94.5	585	1760	6	3.82
GEZ88ES	GEZ88ES-2RS	88.9	139.7	77.775	66.675	101.6	680	2040	6	4.79
GEZ95ES	GEZ95ES-2RS	95.25	149.225	83.337	71.425	108.7	780	2360	6	5.78
GEZ101ES	GEZ101ES-2RS	101.6	158.75	88.9	76.2	115.8	900	2650	6	6.99
GEZ107ES	GEZ107ES-2RS	107.95	168.275	94.463	80.95	122.8	1000	3000	6	8.41
GEZ114ES	GEZ114ES-2RS	114.3	177.8	100.013	85.725	130.6	1120	3400	6	9.79
GEZ120ES	GEZ120ES-2RS	120.65	187.325	105.562	90.475	137.6	1250	3750	6	11.5
GEZ127ES	GEZ127ES-2RS	127	196.85	111.125	95.25	145.3	1400	4150	6	13.5
GEZ152ES	GEZ152ES-2RS	152.4	222.25	120.65	104.775	168.2	1730	5200	5	17.5

With Two Piece GE..XS/K



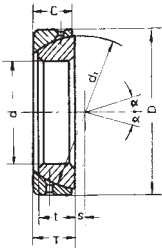
Bearing Number	Dimensions mm					Basic Load Rating kN		α° $\approx$	Weight kg
	d	D	t	C	d ₁ min	Dynamic	Static		
GE12XS/K	12	22	11	9	14	12.9	39.2	7	0.019
GE15XS/K	15	26	13	11	17.5	19.5	57.8	6	0.028
GE20XS/K	20	32	16	14	23	31.3	94.8	4	0.053
GE22XS/K	22	37	19	16	25.5	40.3	122	6	0.085
GE25XS/K	25	42	21	18	29	51.1	155	5	0.116
GE30XS/K	30	50	27	23	36	81.2	248	6	0.225
GE35XS/K	35	55	30	26	40	103	314	5	0.302
GE40XS/K	40	62	33	28	44	122	370	6	0.375
GE45XS/K	45	72	36	31	50.5	152	461	5	0.598
GE50XS/K	50	80	42	36	58.5	225	622	5	0.869
GE55XS/K	55	90	47	40	64.5	253	768	6	1.26
GE60XS/K	60	100	53	45	72.5	321	980	6	1.72
GE65XS/K	65	105	55	47	76	350	1060	5	2.05
GE70XS/K	70	110	58	50	81.5	396	1220	5	2.23
GE75XS/K	75	120	64	55	89.5	478	1450	5	3.01
GE80XS/K	80	130	70	60	97.5	571	1730	5	3.98
GE85XS/K	85	135	74	63	100.5	624	1890	6	4.31
GE90XS/K	90	140	79	65	105.5	670	2030	5	4.72
GE95XS/K	95	150	82	70	113.5	776	2350	5	6.05
GE100XS/K	100	160	88	75	121.5	891	2700	5	7.43
GE110XS/K	110	170	93	80	130	1010	3070	5	8.54
GE115XS/K	115	180	98	85	132.5	1110	3370	5	10.3
GE120XS/K	120	190	105	90	140	1250	3780	6	12.4
GE130XS/K	130	200	110	95	148.5	1390	4220	5	13.8
GE150XS/K	150	220	120	105	166	1710	5170	5	17.1

Wide Inner Ring And Fitting Crack With Two Piece



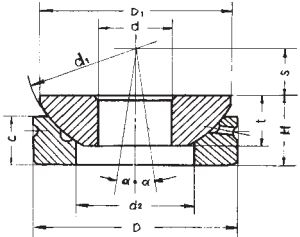
Bearing Number	Dimensions mm					Basic Load Rating kN		α° ≈	Weight kg
	d	D	t	C	d,min	Dynamic	Static		
Normal Series									
GE220XS	220	320	135	100	238	2320	11600	8	35.5
GE240XS	240	340	140	100	265	2550	12700	8	40
GE260XS	260	370	150	110	285	3050	15300	7	50
GE280XS	280	400	155	120	310	3550	18000	6	64
GE300XS	300	430	165	120	330	3800	19000	7	75
Series C									
GEC320XS	320	440	160	135	340	4400	22000	4	77
GEC340XS	340	460	160	135	360	4650	23200	3	82
GEC360XS	360	480	160	135	380	4800	24000	3	88
GEC380XS	380	520	190	160	400	6300	31500	4	127
GEC400XS	400	540	190	160	425	6550	32500	3	132
GEC420XS	420	560	190	160	445	6800	34500	3	145
Series GEEM									
GEEM20ES-2RS	20	35	24	12	24	30	146	6	0.073
GEEM25ES-2RS	25	42	29	16	29	48	240	4	0.13
GEEM30ES-2RS	30	47	30	16	34	62	310	4	0.17
GEEM35ES-2RS	35	55	35	20	40	80	400	4	0.25
GEEM40ES-2RS	40	62	38	22	45	100	500	4	0.35
GEEM45ES-2RS	45	68	40	25	52	127	640	4	0.49
GEEM50ES-2RS	50	72	43	28	57	156	780	4	0.60
GEEM60ES-2RS	60	90	54	36	68	245	1220	3	1.15
GEEM70ES-2RS	70	105	65	40	78	315	1560	4	1.65
GEEM80ES-2RS	80	120	74	45	90	400	2000	4	2.50

Angular Contact Spherical Plain Bearings GAC..S



Spherical Plain Bearings

Bearing Number	Dimensions (mm)							Rating Load kN		α° $\approx$	Weight kg
	d	D	t	C	T	d ₁	S	Dynamic	Static		
GAC25S	25	47	15	14	15	42	0.6	47.5	236	3.5	0.148
GAC30S	30	55	17	15	17	49.5	1.3	63	315	3	0.208
GAC35S	35	62	18	16	18	55.5	2.1	76.5	390	3	0.268
GAC40S	40	68	19	17	19	62	2.8	90	450	3	0.327
GAC45S	45	75	20	18	20	68.5	3.5	106	530	3	0.416
GAC50S	50	80	20	19	20	74	4.3	118	585	3	0.455
GAC60S	60	95	23	21	23	88.5	5.7	160	800	3	0.714
GAC70S	70	110	25	23	25	102	7.2	208	1040	2.5	1.04
GAC80S	80	125	29	25.5	29	115	8.6	250	1250	2.5	1.54
GAC90S	90	140	32	28	32	128.5	10.1	320	1600	2.5	2.09
GAC100S	100	150	32	31	32	141	11.6	345	1760	2	2.34
GAC110S	110	170	38	34	38	155	13	475	2360	2	3.68
GAC120S	120	180	38	37	38	168	14.5	510	2550	2	3.97



Spherical Plain Thrust Bearings GX..S

Bearing Number	Dimensions (mm)									Basic Load Rating (kN)		α° $\approx$	Weight kg
	d	D	t	B	C	d ₁	d ₂	D ₁	S	Dynamic	Static		
GX10S	10	30	9.5	7.5	7	32	15.5	27.5	7	24	120	9	0.036
GX12S	12	35	13	9.5	9.3	38	18	32	8	32.5	163	8	0.072
GX15S	15	42	15	11	10.8	46	22.5	39	10	52	260	8	0.108
GX17S	17	47	16	11.8	11.2	52	27	43.5	11	58.5	300	10	0.137
GX20S	20	55	20	14.5	13.8	60	31	50	12.5	75	375	9	0.246
GX25S	25	62	22.5	16.5	16.7	68	34.5	58.5	14	129	640	7	0.415
GX30S	30	75	26	19	19	82	42	70	17.5	170	850	7	0.614
GX35S	35	90	28	22	20.7	98	50.5	84	22	260	1290	8	0.973
GX40S	40	105	32	27	21.5	114	59	97	24.5	375	1860	9	1.59
GX45S	45	120	36.5	31	25.5	128	67	110	27.5	490	2450	9	2.24
GX50S	50	130	42.5	33	30.5	139	70	120	30	655	3250	7	3.14
GX60S	60	150	45	37	34	160	84	140	35	735	3650	8	4.63
GX70S	70	160	50	42	36.5	176	94.5	153	35	800	4050	8	5.37
GX80S	80	180	50	43.5	38	197	107.5	172	42.5	1040	5200	8	6.91
GX100S	100	210	59	51	46	222	127	198	45	1200	6000	8	10.98
GX120S	120	230	64	53.5	50	250	145	220	52.5	1250	6200	6	13.97

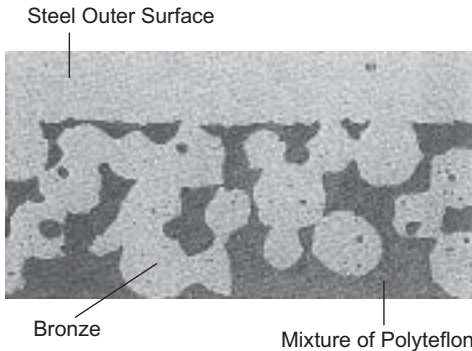
Dry Bushings

Smooth, Oilless Operation

The Dry Bushing (or DU bushing) is the ultimate in oilless bearing design, using lead and tetrafluoroethylene (Teflon) having excellent wear resistance which optimizes metal properties such as strength and dimensional stability.

Coefficients of static and dynamic friction are so small that the bearing surfaces run smoothly without lubrication, while at the same time eliminating sticking and slipping. Unlike regular bearings which require constant lubrication, the DU type does away with the need for costly maintenance. It is also possible to combine them with parts totally submerged in a lubricant.

Design



FEATURES

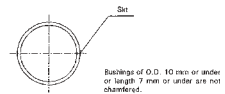
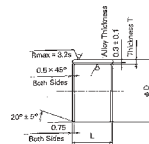
1. The bearing surfaces have such low coefficients of static and dynamic friction that they require no lubrication.
DU bearings can also be used in lubricants.
2. The operating temperature range extends from -200°C to 280°C.
3. DU bearings operate smoothly under loads which exert high levels of resistance, impact, intermittent motion, and thrust.
4. DU bearings are free from electrostatic induction. When installed, each DU bearing has an electrical resistance of 1Ω to 10Ω per 1 cm² wide contact area.)
5. The bearing surface is highly resistant to most industrial chemicals and solvents including gas, oil, and alcohol.

6. The mating surface (mounting shaft) is wear resistant.
7. Service life is extended.
8. DU bearings are light and thin (up to 3 mm thick), requiring little space and permit compact equipment design.
9. DU bearings minimize operating noise.
10. Standard DU bearings are available for quick delivery.
Non-standard DU bearings can be made to order.

DU Bushings

Dimensions of Thickness for MB.... DU series

Bushing normal I.D.		Thickness T
Over	Or under	
ø3	ø18	1.0 ⁰ _{-0.025}
ø18	ø25	1.5 ⁰ _{-0.030}
ø25	ø40	2.0 ⁰ _{-0.030}
ø40	ø60	2.5 ⁰ _{-0.040}
ø60	ø160	2.47 ⁰ _{-0.050}

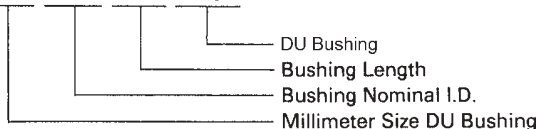


Characteristics

Product Name	Specific Load kgf/cm ²		Slide Speed m/min		Operating Temp. Range °C		Friction Coefficient μ		Tolerance of Foreign Particles
	Max	Normal	Max	Normal	Max	Min	Min	Normal	
DU Dry Bearing	1400	500 or Under	60	15 or Under	280	200	0.03 (P270) Varies by PV Value	0.04 ~ 0.2	Dust intrusion shall be minimized.

DU Bushing

MB ○ ○ ○ ○ DU

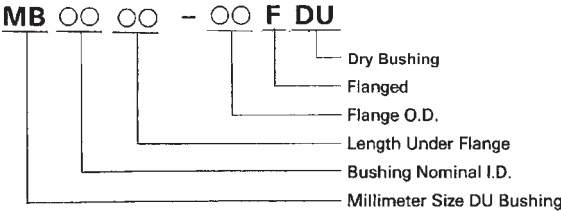


Bushing I.D.	Tolerances		Bushing Number and Bushing Length (mm)								
	Housing Dia.	Shaft Dia.	3	4	5	6	7	8	10	12	15
3	5H7 ^{+0.012} ₀	3 ^{-0.025} _{-0.035}	MB0303DU	MB0304DU	MB0305DU	MB0306DU					
4	6 "	4 ^{-0.025} _{0.037}		MB0404DU		MB0406DU		MB0408DU			
5	7H7 ^{+0.015} ₀	5 "		MB0504DU	MB0505DU	MB0506DU		MB0508DU			
6	8 "	6 "			MB0605DU	MB0606DU	MB0607DU	MB0608DU	MB0610DU		
7	9 "	7 ^{-0.025} _{-0.040}			MB0705DU		MB0707DU		MB0710DU	MB0712DU	
8	10 "	8 "			MB0805DU	MB0806DU	MB0807DU	MB0808DU	MB0810DU	MB0821DU	
9	11H7 ^{+0.018} ₀	9 "							MB0910DU		
10	12 "	10 "				MB1006DU	MB1007DU	MB1008DU	MB1010DU	MB1012DU	MB1015DU
12	14 "	12 ^{-0.025} _{-0.043}				MB1206DU		MB1208DU	MB1210DU	MB1212DU	MB1215DU
13	15 "	13 "						MB1308DU	MB1310DU		MB1315DU
14	16 "	14 "							MB1410DU	MB1412DU	MB1415DU
15	17 "	15 "						MB1508DU	MB1510DU	MB1512DU	MB1515DU
16	18 "	16 "							MB1610DU	MB1612DU	MB1615DU
17	19H7 ^{+0.021} ₀	17 "									MB1715DU
18	20 "	18 "							MB1810DU	MB1812DU	MB1815DU
19	22 "	19 ^{-0.025} _{-0.046}							MB1910DU		MB1915DU
20	23 "	20 "							MB2010DU	MB2012DU	MB2015DU
22	25 "	22 "							MB2210DU	MB2212DU	MB2215DU
24	27 "	24 "									MB2415DU
25	28 "	25 "							MB2510DU	MB2512DU	MB2515DU
26	30 "	26 "									MB2615DU
28	32H7 ^{+0.025} ₀	28 "								MB2812DU	MB2815DU
30	34 "	30 "								MB3012DU	MB3015DU
31	35 "	31 ^{-0.025} _{-0.050}									MB3115DU
32	36 "	32 "									
35	39 "	35 "								MB3512DU	
38	42 "	38 "									
40	44 "	40 "								MB4012DU	MB4015DU
45	50 "	45 "									
50	55H7 ^{+0.030} ₀	50 "									
55	60 "	55 ^{-0.025} _{-0.055}									
60	65 "	60 "									
65	70 "	65 ^{+0.035} _{+0.005}									
70	75 "	70 "									
75	80 "	75 "									
80	85H7 ^{+0.035} ₀	80 "									
85	90 "	85 ^{+0.035} ₀									
90	95 "	90 "									
100	105 "	100 "									
110	115 "	110 "									
120	125H7 ^{+0.040} ₀	120 "									
130	135 "	130 ^{+0.035} _{0.005}									
140	145 "	140 "									
150	155 "	150 "									
160	165 "	160 "									

Note 1. For standard bushing, min. clearance is 0.025mm.

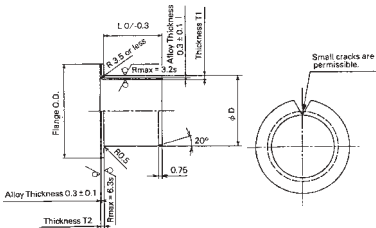
Bushing Number and Bushing Length (mm)											
20	25	30	35	40	50	60	70	80	90	95	100
MB1020DU											
MB1220DU											
MB1420DU											
MB1520DU	MB1525DU										
MB1620DU	MB1625DU										
MB1820DU	MB1825DU										
MB2020DU	MB2025DU	MB2030DU									
MB2220DU	MB2225DU										
MB2420DU	MB2425DU	MB2430DU									
MB2520DU	MB2525DU	MB2530DU	MB2535DU								
MB2620DU		MB2630DU									
MB2820DU	MB2825DU	MB2830DU									
MB3020DU	MB3025DU	MB3030DU	MB3035DU	MB3040DU							
	MB3125DU			MB3140DU							
MB3220DU	MB3225DU	MB3230DU		MB3240DU							
MB3520DU	MB3525DU	MB3530DU	MB3535DU	MB3540DU	MB3550DU						
MB3820DU	MB3825DU	MB3830DU	MB3835DU	MB3840DU							
MB4020DU	MB4025DU	MB4030DU	MB4035DU	MB4040DU	MB4050DU						
MB4520DU	MB4525DU	MB4530DU	MB4535DU	MB4540DU	MB4550DU						
MB5020DU	MB5025DU	MB5030DU	MB5035DU	MB5040DU	MB5050DU	MB5060DU					
	MB5525DU	MB5530DU	MB5535DU	MB5540DU	MB5550DU	MB5560DU					
		MB6030DU	MB6035DU	MB6040DU		MB6060DU					
		MB6530DU		MB6540DU	MB6550DU	MB6560DU					
		MB7030DU	MB7035DU	MB7040DU	MB7050DU	MB7060DU		MB7080DU			
		MB7530DU	MB7535DU	MB7540DU	MB7550DU	MB7560DU		MB7580DU			
				MB8040DU	MB8050DU	MB8060DU		MB8080DU			
				MB8540DU	MB8550DU	MB8560DU		MB8580DU			
				MB9040DU		MB9060DU			MB9090DU		
					MB10050DU		MB10070DU			MB10095DU	
					MB11050DU		MB11070DU			MB11095DU	
					MB12050DU		MB12070DU			MB12095DU	
					MB13050DU			MB13080DU			
					MB14050DU			MB14080DU			MB140100DU
					MB15050DU			MB15080DU			MB150100DU
					MB16050DU			MB16080DU			MB160100DU

DU Bushing-Flanged



DU Bushings

Bushing		Tolerances		Thickness		Bushing Number and Bushing Length (mm)				
I.D.	Flanged O.D.	Housing Dia.	Shaft Dia.	Bushing T1	Flanged T2	3	4	5	6	7
3	7	4.6H7 ^{+ 0.012} ₀	3 ^{- 0.025} _{- 0.035}	0.8 ⁰ _{- 0.25}	0.8 ⁰ _{- 0.15}	MB0303-7FDU				
4	9	5.6	4 ^{- 0.025} _{- 0.037}				MB0404-9FDU			
5	10	7H7 ^{+ 0.015} ₀	5	1.0 ⁰ _{- 0.25}	1.0 ⁰ _{- 0.15}		MB0504-10FDU	MB0505-10FDU		
6	12	8	6					MB0605-12FDU	MB0606-12FDU	MB0607-12FDU
7	13	9	7 ^{- 0.025} _{- 0.040}					MB0705-13FDU		MB0707-13FDU
8	15	10	8						MB0806-15FDU	
10	18	12H7 ^{+ 0.018} ₀	10						MB1006-18FDU	MB1007-18FDU
12	20	14	12 ^{- 0.025} _{- 0.030}						MB1206-20FDU	
14	22	16	14							
15	23	17	15							
16	24	18	16							
18	26	20H7 ^{+ 0.021} ₀	18							
20	31	23	20 ^{- 0.025} _{- 0.046}	1.5 ⁰ _{- 0.030}	1.5 ⁰ _{- 0.15}					
22	33	25	22							
24	35	27	24							
25	36	28	25							
26	38	30	26	2.0 ⁰ _{- 0.030}	2.0 ⁰ _{- 0.15}					
28	40	32H7 ^{+ 0.025} ₀	28							
30	42	34	30							
31	45	35	31 ^{- 0.025} _{- 0.050}							
32	46	36	32							
35	49	39	35							
38	52	42	38							
40	54	44	40							
45	60	50	45	2.5 ⁰ _{- 0.040}	2.5 ⁰ _{- 0.15}					
50	65	55H7 ^{+ 0.030} ₀	50							
55	70	60	55 ^{- 0.025} _{- 0.055}							
60	75	65	60							

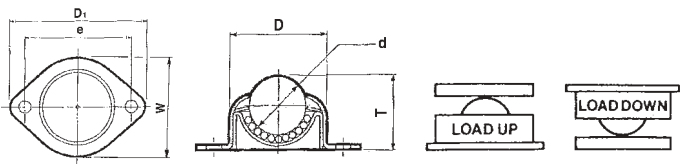


DU Bushing-Flanged

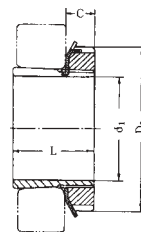
Bushings of O.D. 10mm or under or bushing length 7mm or under are not chamfered.

Bushing Number and Bushing Length (mm)									
8	10	12	15	20	25	30	40	50	60
MB0608-12FDU	MB0610-12FDU								
	MB0710-13FDU	MB0712-13FDU							
MB0808-15FDU	MB0810-15FDU	MB0812-15FDU							
MB1008-18FDU	MB1010-18FDU	MB1012-18FDU	MB1015-18FDU						
MB1208-20FDU	MB1210-20FDU	MB1212-20FDU	MB1215-20FDU	MB1220-20FDU					
	MB1410-22FDU	MB1412-22FDU	MB1415-22FDU	MB1420-22FDU					
	MB1510-12FDU	MB1512-23FDU	MB1515-23FDU	MB1520-23FDU	MB1525-23FDU				
	MB1610-24FDU	MB1612-24FDU	MB1615-24FDU	MB1620-24FDU	MB1625-24FDU				
	MB1810-26FDU	MB1812-26FDU	MB1815-26FDU	MB1820-26FDU	MB1825-26FDU				
	MB2010-31FDU	MB2012-21FDU	MB2015-31FDU	MB2020-31FDU	MB2025-31FDU	MB2030-31FDU			
	MB2210-33FDU	MB2212-33FDU	MB2215-33FDU	MB2220-33FDU	MB2225-33FDU				
			MB2415-35FDU	MB2420-35FDU	MB2425-35FDU	MB2430-35FDU			
	MB2510-36FDU	MB2512-36FDU	MB2515-36FDU	MB2520-36FDU	MB2525-36FDU	MB2530-36FDU			
			MB2615-38FDU	MB2620-38FDU					
		MB2812-40FDU	MB2815-40FDU	MB2820-40FDU		MB2830-40FDU			
		MB3012-42FDU	MB3015-42FDU	MB3020-42FDU	MB3025-42FDU	MB3030-42FDU	MB3040-42FDU		
					MB3125-45FDU				
				MB3220-46FDU	MB3225-46FDU	MB3230-46FDU			
		MB3512-49FDU		MB3520-49FDU	MB3525-49FDU	MB3530-49FDU	MB3540-49FDU	MB3550-49FDU	
				MB3820-52FDU		MB3830-52FDU	MB3840-52FDU		
		MB4012-54FDU		MB4020-54FDU	MB4025-54FDU	MB4030-54FDU	MB4040-54FDU	MB4050-54FDU	
				MB4520-60FDU	MB4525-60FDU	MB4530-60FDU	MB4540-60FDU	MB4550-60FDU	
				MB5020-65FDU		MB5030-65FDU	MB5040-65FDU		MB5060-65FDU
						MB5530-70FDU	MB5540-70FDU		MB5560-70FDU
						MB6030-75FDU	MB6040-75FDU		MB6060-75FDU

Ball Transfer



Bearing Number	Equivalent Number	Dimensions							Load (N)		Weight (g)
		BALL DIA d		D	D _i	e	W	T	Load Up	Load Down	
		inch	mm	mm	mm	mm	mm	mm			
C8-Y	BT254-1 or PCP254B	1	25.4	42.0	70.0	56.0	50.8	30.5	540	250	140



With Lock Nuts and Lock Washer

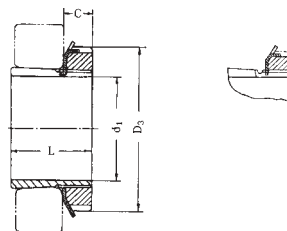
Series H 200 / HE 200

HS 200 / HA 200

Adapter Sleeve Number				Dimensions							Weight (kg)
				d ₁				L	D ₃	C	
H	HE	HS	(HA)	H mm	HEin.	HSin.	HAin.	mm	mm	mm	
H 205X	HE 205	—	—	20	$\frac{3}{4}$	—	—	26	38	8	0.070
06X	06	—	HA 206	25	1	—	$\frac{15}{16}$	27	45	8	0.099
07X	—	HS 207	07	30	—	$1\frac{1}{8}$	$1\frac{3}{16}$	29	52	9	0.125
H 208X	HE 208	HS 208	—	35	$1\frac{1}{4}$	$1\frac{3}{8}$	—	31	58	10	0.174
09X	09	09	HA 209	40	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{7}{16}$	33	65	11	0.226
10X	10	—	10	45	$1\frac{3}{4}$	—	$1\frac{11}{16}$	35	70	12	0.274
H 211X	HE 211	HS 211	HA 211	50	2	$1\frac{7}{8}$	$1\frac{15}{16}$	37	75	12	0.308
12X	—	12	—	55	—	$2\frac{1}{8}$	—	38	80	13	0.346
13X	13	13	13	60	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{3}{16}$	40	85	14	0.401
H 214X	—	—	—	60	—	—	—	41	92	14	0.550
15X	HE 215	HS 215	HA 215	65	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{7}{16}$	43	98	15	0.708
16X	16	—	16	70	$2\frac{3}{4}$	—	$2\frac{11}{16}$	46	105	17	0.881
H 217X	HE 217	HE 217	HE 217	75	3	$2\frac{7}{8}$	$2\frac{15}{16}$	50	110	18	1.02
18X	—	18	—	80	—	$3\frac{1}{8}$	—	52	120	18	1.18
19X	19	—	—	85	$3\frac{1}{4}$	—	—	55	125	19	1.37
H 220X	HE 220	—	—	90	$3\frac{1}{2}$	—	—	58	130	20	1.49
21X	—	—	—	95	—	—	—	60	140	20	1.70
22X	22	—	—	100	4	—	—	63	145	21	1.93

Series

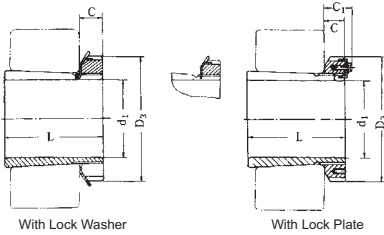
H 300 / HE 300/ HS 300 / HA 300



Adapter Sleeve Number				Dimensions							Weight (kg)
				d ₁				L	D ₂	C	
H	HE	HS	(HA)	H mm	HEin.	HSin.	HAin.	mm	mm	mm	
H 305X	HE 305	—	—	20	$\frac{3}{4}$	—	—	29	38	8	0.075
06X	06	—	HA 306	25	1	—	$\frac{15}{16}$	31	45	8	0.109
07X	—	HS 307	07	30	—	$1\frac{1}{8}$	$1\frac{3}{16}$	35	52	9	0.142
H 308X	HE 308	HS 308	—	35	$1\frac{1}{4}$	$1\frac{3}{8}$	—	36	58	10	0.189
09X	09	09	HA 309	40	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{7}{16}$	39	65	11	0.248
10X	10	—	10	45	$1\frac{3}{4}$	—	$1\frac{11}{16}$	42	70	12	0.302
H 311X	HE 311	HS 311	HA 311	50	2	$1\frac{7}{8}$	$1\frac{15}{16}$	45	75	12	0.345
12X	—	12	—	55	—	$2\frac{1}{8}$	—	47	80	13	0.393
13X	13	13	13	60	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{3}{16}$	50	85	14	0.459
H 314X	—	—	—	60	—	—	—	52	92	14	0.723
15X	HE 315	HS 315	HA 315	65	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{7}{16}$	55	98	15	0.830
16X	16	—	16	70	$2\frac{3}{4}$	—	$2\frac{11}{16}$	59	105	17	1.03
H 317X	HE 317	HE 317	HE 317	75	3	$2\frac{7}{8}$	$2\frac{15}{16}$	63	110	18	1.18
18X	—	18	—	80	—	$3\frac{1}{8}$	—	65	120	18	1.37
19X	19	—	—	85	$3\frac{1}{4}$	—	—	68	125	19	1.56
H 320X	HE 320	—	—	90	$3\frac{1}{2}$	—	—	71	130	20	1.69
21X	—	—	—	95	—	—	—	74	140	20	1.93
22X	22	—	—	100	4	—	—	77	145	21	2.18

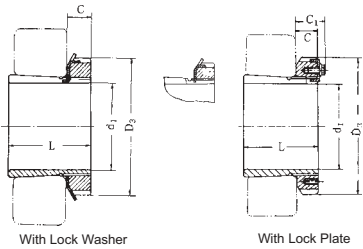
Series

H 2300 / HE 2300 / HS 2300 / HA 2300



Adapter Sleeve Number				Dimensions								Weight (kg)
				d ₁				L	D ₃	C	C ₁	
H	HE	HS	(HA)	H mm	HEin.	HSin.	HAin.	mm	mm	mm	mm	
H 2305X	HE 2305	—	—	20	$\frac{3}{4}$	—	—	35	38	8	—	0.087
06X	06	—	HA 2306	25	1	—	$\frac{15}{16}$	38	45	8	—	0.126
07X	—	HS 2307	07	30	—	$1\frac{1}{8}$	$1\frac{3}{16}$	43	52	9	—	0.165
H 2308X	HE 2308	HS 2308	—	35	$1\frac{1}{4}$	$1\frac{3}{8}$	—	46	58	10	—	0.224
09X	09	09	HA 2309	40	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{7}{16}$	50	65	11	—	0.280
10X	10	—	10	45	$1\frac{3}{4}$	—	$1\frac{11}{16}$	55	70	12	—	0.362
H 2311X	HE 2311	HS 2311	HA 2311	50	2	$1\frac{7}{8}$	$1\frac{15}{16}$	59	75	12	—	0.420
12X	—	12	—	55	—	$2\frac{1}{8}$	—	62	80	13	—	0.480
13X	13	13	13	60	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{3}{16}$	65	85	14	—	0.556
H 2314	—	—	—	60	—	—	—	68	92	14	—	0.897
15X	HE 2315	HS 2315	HA 2315	65	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{7}{16}$	73	98	15	—	1.05
16X	16	—	16	70	$2\frac{3}{4}$	—	$2\frac{11}{16}$	78	105	17	—	1.28
H 2317X	HE 2317	HE 2317	HE 2317	75	3	$2\frac{7}{8}$	$2\frac{15}{16}$	82	110	18	—	1.45
18X	—	18	—	80	—	$3\frac{1}{8}$	—	86	120	18	—	1.70
19X	19	—	—	85	$3\frac{1}{4}$	—	—	90	125	19	—	1.94
H 2320X	HE 2320	—	—	90	$3\frac{1}{2}$	—	—	97	130	20	—	2.15
—	—	—	—	—	—	—	—	—	—	—	—	—
22X	22	—	—	100	4	—	—	105	145	21	—	2.74
H 2324X	HE 2324	—	—	110	$4\frac{1}{4}$	—	—	112	155	22	—	3.20
26	26	—	—	115	$4\frac{1}{2}$	—	—	121	165	23	—	4.60
28	28	—	—	125	5	—	—	131	180	24	—	5.52
H 2330	HE 2330	—	—	135	$5\frac{1}{4}$	—	—	139	195	26	—	6.60
32	32	—	—	140	$5\frac{1}{2}$	—	—	147	210	28	—	9.15
32	34	—	—	150	6	—	—	154	220	29	—	10.4
H 2336	HE 2336	—	—	160	$6\frac{1}{2}$	—	—	161	230	30	—	11.3
38	38	—	—	170	$6\frac{3}{4}$	—	—	169	240	31	—	12.6
40	40	—	—	180	7	—	—	176	250	32	—	13.9
H 2344	—	—	—	200	—	—	—	183	280	32	44	16.6
48	—	—	—	220	—	—	—	196	300	34	46	19.7
52	—	—	—	240	—	—	—	208	330	36	49	24.2
H 2356	—	—	—	260	—	—	—	221	350	38	51	27.8

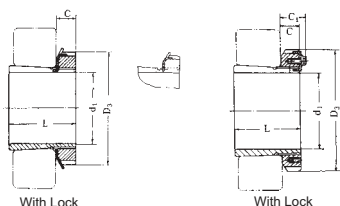
Series H 3000 / HE 3000



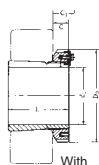
Adapter Sleeve Number		d ₁		Dimensions				Weight (kg)
				L mm	D ₃ mm	C mm	C ₁ mm	
H	HE	H mm	HE in					
H 3024 X	HE 3024	110	4 1/4	72	145	22	—	1.96
26	26	115	4 1/2	80	155	23	—	2.85
28	28	125	5	82	165	24	—	3.18
H 3030	HE 3030	135	5 1/4	87	180	26	—	3.90
32	32	140	5 1/2	93	190	28	—	5.20
34	34	150	6	101	200	29	—	6.00
H 3036	HE 3036	160	6 1/2	109	210	30	—	6.85
38	38	170	6 3/4	112	220	31	—	7.45
40	40	180	7	120	240	32	—	9.20
H 3044	—	200	—	128	260	30	41	10.3
48	—	220	—	133	290	34	46	13.4
52	—	240	—	147	300	34	46	15.6
H 3056	—	260	—	152	330	38	50	17.7
60	—	280	—	168	360	42	54	22.8
64	—	300	—	171	380	42	55	24.6
H 3068	—	320	—	187	400	45	58	28.6
72	—	340	—	188	420	45	58	30.6
76	—	360	—	193	450	48	62	35.8
H 3080	—	380	—	210	470	52	66	41.5
84	—	400	—	212	490	52	66	43.6
88	—	410	—	228	520	60	77	65.5
H 3092	—	430	—	234	540	60	77	69.4
96	—	450	—	237	560	60	77	73.5
H 30/500	—	470	—	247	580	68	85	82.0

Adapter Sleeve

Series H 3100 / HE 3100



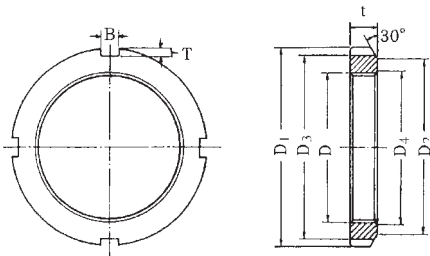
Adapter Sleeve Number		d ₁		Dimensions				Weight (kg)
H	HE	H mm	HE in	L mm	D ₃ mm	C mm	C ₁ mm	
H 3122 X	HE 3122	100	4	81	145	21	—	2.25
24 X	24	110	4 1/4	88	155	22	—	2.64
26	26	115	4 1/2	92	165	23	—	3.66
H 3128	HE 3128	125	5	97	180	24	—	4.34
30	30	135	5 1/4	111	195	26	—	5.54
32	32	140	5 1/2	119	210	28	—	7.70
H 3134	HE 3134	150	6	122	220	29	—	8.40
36	36	160	6 1/2	131	230	30	—	9.50
38	38	170	6 3/4	141	240	31	—	10.8
H 3140	HE 3140	180	7	150	250	32	—	12.1
44	—	200	—	158	280	32	44	14.7
48	—	220	—	169	300	34	46	17.3
H 3152	—	240	—	187	330	36	49	22.0
56	—	260	—	192	350	38	51	24.5
60	—	280	—	208	380	40	53	30.3
H 3164	—	300	—	226	400	42	56	35.0
68	—	320	—	254	440	55	72	49.5
72	—	340	—	259	460	58	75	54.5
H 3176	—	360	—	264	490	60	77	61.6
80	—	380	—	272	520	62	82	70.8
84	—	400	—	304	540	70	90	84.5
H 3188	—	410	—	307	560	70	90	108.0
92	—	430	—	326	580	75	95	116.0
96	—	450	—	335	620	75	95	133.0
H 31/500	—	470	—	356	630	80	100	146.0



Series H 3200

Adapter Sleeve Number		Dimensions					Weight (kg)
		d ₁ mm	L mm	D ₃ mm	C mm	C ₁ mm	
H 3260		280	240	380	40	53	34.0
64		300	258	400	42	56	39.4
68		320	288	440	55	72	54.6
H 3272		340	299	460	58	75	60.2
76		360	310	490	60	77	69.6
80		380	328	520	62	82	81.0
H 3284		400	352	540	70	90	94.0
88		410	361	560	70	90	118.0
92		430	382	580	75	95	132.0
H 3296		450	397	620	75	95	152.0
32/500		470	428	630	80	100	166.0

Lock Nut and Lock Washer
Series AN, ANL, AW, AWL

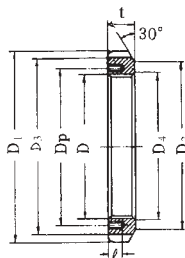
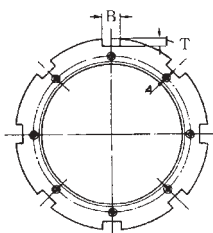


Adapter Sleeve

Series AN		Dimensions										ANL Series		Thread (Diameter, D x Pitch)
Lock Nut Number	Lock Washer Number	AN series			AN/ANL				ANL Series			Lock Washer Number	Lock Nut Number	
		D ₁	D ₂	D ₃	t	B	T	D ₄	D ₁	D ₂	D ₃			
AN 00	AW 00	18	13	14	4	3	2	10.5	–	–	–	–	–	M 10X0.75
01	01	22	17	18	4	3	2	12.5	–	–	–	–	–	12X1
02	02	25	21	21	5	4	2	15.5	–	–	–	–	–	15X1
AN 03	AW 03	28	24	24	5	4	2	17.5	–	–	–	–	–	M 17X1
04	04	32	26	28	6	4	2	20.5	–	–	–	–	–	20X1
05	05	38	32	34	7	5	2	25.8	–	–	–	–	–	25X1.5
AN 06	AW 06	45	38	41	7	5	2	30.8	–	–	–	–	–	M 30X1.5
07	07	52	44	48	8	5	2	35.8	–	–	–	–	–	35X1.5
08	08	58	50	53	9	6	2.5	40.8	–	–	–	–	–	40X1.5
AN 09	AW 09	65	56	60	10	6	2.5	45.8	–	–	–	–	–	M 45X1.5
10	10	70	61	65	11	6	2.5	50.8	–	–	–	–	–	50X1.5
11	11	75	67	69	11	7	3	56	–	–	–	–	–	55X2
AN 12	AW 12	80	73	74	11	7	3	61	–	–	–	–	–	M 60X2
13	13	85	79	79	12	7	3	66	–	–	–	–	–	65X2
14	14	92	85	85	12	8	3.5	71	–	–	–	–	–	70X2
AN 15	AW 15	98	90	91	13	8	3.5	76	–	–	–	–	–	M 75X2
16	16	105	95	98	15	8	3.5	81	–	–	–	–	–	80X2
17	17	110	102	103	16	8	3.5	86	–	–	–	–	–	85X2
AN 18	AW 18	120	108	112	16	10	4	91	–	–	–	–	–	M 90X2
19	19	125	113	117	17	10	4	96	–	–	–	–	–	95X2
20	20	130	120	122	18	10	4	101	–	–	–	–	–	100X2
AN 21	AW 21	140	126	130	18	12	5	106	–	–	–	–	–	M 105X2
22	22	145	133	135	19	12	5	111	–	–	–	–	–	110X2
23	23	150	137	140	19	12	5	116	–	–	–	–	–	115X2
AN 24	AW 24	155	138	145	20	12	5	121	145	133	135	AWL 24	ANL 24	M 120X2
25	25	160	148	150	21	12	5	126	–	–	–	–	–	125X2
26	26	165	149	155	21	12	5	131	155	143	145	AWL 26	ANL 26	130X2
AN 27	AW 27	175	160	163	22	14	6	136	–	–	–	–	–	M 135X2
28	28	180	160	168	22	14	6	141	165	151	153	AWL 28	ANL 28	140X2
29	29	190	171	178	24	14	6	146	–	–	–	–	–	145X2
AN 30	AW 30	195	171	183	24	14	6	151	180	164	168	AWL 30	ANL 30	M 150X2
31	31	200	182	186	25	16	7	156.5	–	–	–	–	–	155X3
32	32	210	182	196	25	16	7	161.5	190	174	176	AWL 32	ANL 32	160X3
AN 33	AW 33	210	193	196	26	16	7	166.5	–	–	–	–	–	M 165X3
34	34	220	193	206	26	16	7	171.5	200	184	186	AWL 34	ANL 34	170X3
36	36	230	203	214	27	18	8	181.5	210	192	194	36	36	180X3
AN 38	AW 38	240	214	224	28	18	8	191.5	220	202	204	AWL 38	ANL 38	M 190X3
40	40	250	226	234	29	18	8	201.5	240	218	224	40	40	200X3

* ANL Nut for H30 Adapter

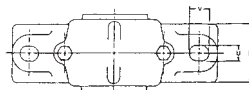
Lock Nut Series AN, ANL



Lock Nut Number	Dimensions (mm)										
	Thread (Diameter, D x Pitch)	D ₁	D ₂	D ₃	B	T	D ₄	t	PLATE HOLE		
									Thread (Diameter, D x Pitch)	I	D _i
AN 44	Tr 220X4	280	250	260	20	10	222	32	M 8X1.25	15	238
48	240X4	300	270	280	20	10	242	34	8X1.25	15	258
52	260X4	330	300	306	24	12	262	36	10X1.5	18	281
AN 56	Tr 280X4	350	320	326	24	12	282	38	M 10X1.5	18	301
60	300X4	380	340	356	24	12	302	40	10X1.5	18	326
64	320X5	400	360	376	24	12	322.5	42	10X1.5	18	345
AN 68	Tr 340X5	440	400	410	28	15	342.5	55	M 12X1.75	21	372
72	360X5	460	420	430	28	15	362.5	58	12X1.75	21	392
76	380X5	490	450	454	32	18	382.5	60	12X1.75	21	414
AN 80	Tr 400X5	520	470	484	32	18	402.5	62	M 16X2	27	439
84	420X5	540	490	504	32	18	422.5	70	16X2	27	459
88	440X5	560	510	520	36	20	442.5	70	16X2	27	477
Nut-Series ANL *											
AN 44	Tr 220X4	260	242	242	20	9	222	30	M 6X1	12	229
48	240X4	290	270	270	20	10	242	34	8X1.25	15	253
52	260X4	310	290	290	20	10	262	34	8X1.25	15	273
AN 56	Tr 280X4	330	310	310	24	10	282	38	M 8X1.25	15	293
60	300X4	360	336	336	24	12	302	42	8X1.25	15	316
64	320X5	380	356	356	24	12	322.5	42	8X1.25	15	335
AN 68	Tr 340X5	400	376	376	24	12	342.5	45	M 8X1.25	15	355
72	360X5	420	394	394	28	13	362.5	45	8X1.25	15	374
76	380X5	450	422	422	28	14	382.5	48	10X1.5	18	398
AN 80	Tr 400X5	470	442	442	28	14	402.5	52	M 10X1.5	18	418
84	420X5	490	462	462	32	14	422.5	52	10X1.5	18	438
88	440X5	520	490	490	32	15	442.5	60	12X1.75	21	462
AN 92	Tr 460X5	540	510	510	32	15	462.5	60	M 12X1.75	21	482
96	480X5	560	530	530	36	15	482.5	60	12X1.75	21	502

* ANL Nut for H30 Adapter

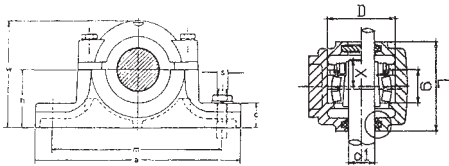
Plummer Blocks SN500 Series



Plumber Block

Housing No.	Shaft Dia. d _{1/2}		Dimensions (mm)								
	mm	in*	D	a	b	c	g	h	L	W	m
SN505	20	3/4	52	165	46	22	25	40	67	75	130
SN506	25	1	62	185	52	22	30	50	77	90	150
SN507	30	1-1/8	72	185	52	22	33	50	82	95	150
SN508	35	1-1/4	80	205	60	25	33	60	85	110	170
SN509	40	1-1/2	85	205	60	25	31	60	85	112	170
SN510	45	1-3/4	90	205	60	25	33	60	90	115	170
SN511	50	2	100	255	70	28	33	70	95	130	210
SN512	55	2-1/8	110	255	70	30	38	70	105	135	210
SN513	60	2-1/4	120	275	80	30	43	80	110	150	230
SN515	65	2-1/2	130	280	80	30	41	80	115	155	230
SN516	70	2-3/4	140	315	90	32	43	95	120	175	260
SN517	75	3	150	320	90	32	46	95	125	185	260
SN518	80	3-1/4	160	345	100	35	62.4	100	145	195	290
SN519	85		170	345	100	35	53	112	140	210	290
SN520	90	3-1/2	180	380	110	40	70.3	112	160	218	320
SN522	100	4	200	410	120	45	80	125	175	240	350
SN524	110	4-1/4	215	410	120	45	86	140	185	270	350
SN526	115	4-1/2	230	445	130	50	90	150	190	290	380
SN528	125	5	250	500	150	50	98	150	205	305	420
SN530	135	5-1/4	270	530	160	60	106	160	220	325	450
SN532	140	5-1/2	290	550	160	60	114	170	235	345	470

*Adapter sleeve for inch shaft.



Dimensions (mm)						Adapter. Sleeve		Locating Ring		Housing No.
s	u	v	Housing Weight kg	Bearing No.		mm	inch	Number	QTY	
M12	15	20	1.40	1205K 2205K	22205K	H 205 H 305	HE 205 HE305	SR52 x 5 SR52 x 7	2 1	SN505
M12	15	20	2.15	1206K 2206K	22206K	H 206 H 306	HE 206 HE 306	SR62 x 7 SR62 x 10	2 1	SN506
M12	15	20	2.35	1207K 2207K	22207K	H 207 H 307	HE 207 HE 307	SR72 x 8 SR72 x 10	2 1	SN507
M12	15	20	3.20	1208K 2208K	22208K	H 208 H 308	HE 208 HE 308	SR80 x 7.5 SR80 x 10	2 1	SN508
M12	15	20	3.00 4.40	1209K 2209K	22209K	H 209 H 309	HE 209 HE 309	SR85 x 6 SR85 x 8	2 1	SN509
M12	15	20	3.75 5.00	1210K 2210K	22210K	H 210 H 310	HE 210 HE 310	SR90 x 6.5 SR90 x 10	2 1	SN510
M16	18	23	5.30 7.15	1211K 2211K	22211K	H 211 H 311	HE 211 HE 311	SR100 x 6 SR100 x 8	2 1	SN511
M16	18	23	6.3 7.95	1212K 2212K	22212K	H212 H312	HE 212 HE 312	SR110 x 8 SR110 x 10	2 1	SN512
M16	18	23	6.80 9.90	1213K 2213K	22213K	H 213 H 313	HE 213 HE 313	SR120 x 10 SR120 x 12	2 1	SN513
M16	18	23	7.40 9.30	1215K 2215K	22215K	H 215 H 315	HE 215 HE 315	SR130 x 8 SR130 x 10	2 1	SN515
M20	22	27	11.40 14.50	1216K 2216K	22216K	H 216 H 316	HE 216 HE 316	SR140 x 8.5 SR140 x 10	2 1	SN516
M20	22	27	11.10 15.50	1217K 2217K	22217K	H 217 H 317	HE 217 HE 317	SR150 x 9 SR150 x 10	2 1	SN517
M20	22	27	17.00 20.2	1218K 2218K	22218K	H 218 H 318 H 2318	HE 218 HE 318 HE 2318	SR160 x 16.2 SR160 x 11.2 SR160 x 10	2 2 1	SN518
M20	22	27	15.5	1219K 2219K	22219K	H 219 H 319	HE 219 HE 319	SR170 x 10.5 SR170 x 10	2 1	SN519
M24	26	32	23.00 27.50	2220K	22220K	H 320 H 2320	HE 320 HE 2320	SR180 x 12.1 SR180 x 10	2 1	SN520
M24	26	32	29.00 35.00	2222K	22222K	H 322 H 2322	HE 322 HE 2322	SR200 x 13.5 SR200 x 10	2 1	SN522
M24	26	32	33.60 43.80		22224K 22224K	H 3124 H 2324	HE 3124 HE 2324	SR215 x 14 SR215 x 10	2 1	SN524
M24	28	36	41.00 50.40		22226K 22226K	H 3126 H 2326	HE 3126 HE 2326	SR 230 x 13 SR230 x 10	2 1	SN526
M30	33	42	49.00 62.00		22228K 22228K	H 3128 H 2328	HE 3128 HE 2328	SR250 x 15 SR250 x 10	2 1	SN528
M30	33	42	60.00 75.00		22230K 22230K	H 3130 H 2330	HE 3130 HE 2330	SR270 x 16.5 Sr270 x 10	2 1	SN530
M30	33	42	68.80 87.00		22232K 22232K	H 3132 H 2332	HE 3132 HE 2332	SR290 x 17 SR290 x 10	2 1	SN532

Conversion Table

inch		0"	1"	2"	3"	4"	5"	6"	7"	8"
Fraction	Decimal									
	.0		25.4	50.8	76.2	101.6	127	152.4	177.8	203.2
1/64	.015625	0.3969	25.7969	51.1969	75.5969	101.9969	127.3969	152.7969	178.1969	203.5969
1/32	.03125	0.7938	26.1938	51.5938	76.9938	102.3938	127.7938	153.1938	178.5938	203.9938
3/64	.046875	1.1906	26.5906	51.9906	77.3906	102.7906	128.1906	153.5906	178.9906	204.3906
1/16	.0625	1.5875	26.9875	52.3875	77.7875	103.1875	128.5875	153.9875	179.3875	204.7875
5/64	.078125	1.9844	27.3844	52.7844	78.1844	103.5844	128.9844	154.3844	179.7844	205.1844
3/32	.09375	2.3813	27.7813	53.1813	78.5813	103.9813	129.3813	154.7813	180.1813	205.5813
7/64	.109375	2.7781	28.1781	53.5781	78.9781	104.3781	129.7781	155.1781	180.5781	205.9781
1/8	.125	3.175	28.575	53.975	79.375	104.775	130.175	155.575	180.975	206.375
9/64	.140625	3.5719	28.9719	54.3719	79.7719	105.1719	130.5719	155.9719	181.3719	206.7719
5/32	.15625	3.9688	29.3688	54.7688	80.1688	105.5688	130.9688	156.3688	181.7688	207.1688
11/64	.171875	4.3656	29.7656	55.1656	80.5656	105.9656	131.3656	156.7656	182.1656	207.5656
3/16	.1875	4.7625	30.1625	55.5625	80.9625	106.3625	131.7625	157.1625	182.5625	207.9625
13/64	.203125	5.1594	30.5594	55.9594	81.3594	106.7594	132.1594	157.5594	182.9594	208.3594
7/32	.21875	5.5563	30.9563	56.3563	81.7563	107.1563	132.5563	157.9563	183.3563	208.7563
15/64	.234375	5.9531	31.3531	56.7531	82.1531	107.5531	132.9531	158.3531	183.7531	209.1531
1/4	.25	6.35	31.75	57.15	82.55	107.95	133.35	158.75	184.15	209.55
17/64	.265625	6.7469	32.1469	57.5469	82.9469	108.3469	133.7469	159.1469	184.5469	209.9469
9/32	.28125	7.1438	32.5438	57.9438	83.3438	108.7438	134.1438	159.5438	184.9438	210.3438
15/64	.296875	7.5406	32.9406	58.3406	83.7406	109.1406	134.5406	159.9406	185.3406	210.7406
5/16	.3125	7.9375	33.3375	58.7375	84.1375	109.5375	134.9375	160.3375	185.7375	211.1375
21/64	.328125	8.3344	33.7344	59.1344	84.5344	109.9344	135.3344	160.7344	186.1344	211.5344
11/32	.34375	8.7313	34.1313	59.5313	84.9313	110.3313	135.7313	161.1313	186.5313	211.9313
23/64	.359375	9.1281	34.5281	59.9281	85.3281	110.7281	136.1281	161.5281	186.9281	212.3281
3/8	.375	9.525	34.925	60.325	85.725	111.125	136.525	161.925	187.325	212.725
25/64	.390625	9.9219	35.3219	60.7219	86.1219	111.5219	136.9219	162.3219	187.7219	213.1219
13/32	.40625	10.3188	35.7188	61.1188	86.5188	111.9188	137.3188	162.7188	188.1188	213.5188
27/64	.421875	10.7156	36.1156	61.5156	86.9156	112.3156	137.7156	163.1156	188.5156	213.9156
7/16	.4375	11.1125	36.5125	61.9125	87.3125	112.7125	138.1125	163.5125	188.9125	214.3125
29/64	.453125	11.5094	36.9094	62.3094	87.7094	113.1094	138.5094	163.9094	189.3094	214.7094
15/32	.46875	11.9063	37.3063	62.7063	88.1063	113.5063	138.9063	164.3063	189.7063	215.1063
31/64	.484375	12.3031	37.7031	63.1031	88.5031	113.9031	139.3031	164.7031	190.1031	215.5031
1/2	.5	12.7	38.1	63.5	88.9	114.3	139.7	165.1	190.5	215.9
33/64	.515625	13.0969	38.4969	63.8969	89.2969	114.6969	140.0969	165.4969	190.8969	216.2969
17/32	.53125	13.4838	38.8938	64.2938	89.6938	115.0938	140.4938	165.8938	191.2938	216.6938
35/64	.546875	13.8906	39.2906	64.6906	90.0906	115.4906	140.8906	166.2906	191.6906	217.0906
9/16	.5625	14.2875	39.6875	65.0875	90.4875	115.8875	141.2875	166.6875	192.0875	217.4875
37/64	.578125	14.6844	40.0844	65.4844	90.8844	116.2844	141.6844	167.0844	192.4844	217.8844
19/32	.59375	15.0813	40.4813	65.8813	91.2813	116.6813	142.0813	167.4813	192.8813	218.2813
39/64	.609375	15.4781	40.8781	66.2781	91.6781	117.0781	142.4781	167.8781	193.2781	218.6781
5/8	.625	15.875	41.275	66.675	92.075	117.475	142.875	168.275	193.675	219.075
41/64	.640625	16.2719	41.6719	67.0719	92.4719	117.8719	143.2719	168.6719	194.0719	219.4719
21/32	.65625	16.6688	42.0688	67.4688	92.8688	118.2688	143.6688	169.0688	194.4688	219.8688
43/64	.671875	17.0656	42.4656	67.8656	93.2656	118.6656	144.0656	169.4656	194.8656	220.2656
11/16	.6875	17.4625	42.8625	68.2625	93.6625	119.0625	144.4625	169.8625	195.2625	220.6625
45/64	.703125	17.8594	43.2594	68.6594	94.0594	119.4594	144.8594	170.2594	195.6594	221.0594
23/32	.71875	18.2563	43.6563	69.0563	94.4563	119.8563	145.2563	170.6536	196.0563	221.4563
47/64	.734375	18.6531	44.0531	69.4531	94.8531	120.2531	145.6531	171.0531	196.4531	221.8531
3/4	.75	19.05	44.45	69.85	95.25	120.65	146.05	171.45	196.85	222.25
49/64	.765625	19.4469	44.8469	70.2469	95.6469	121.0469	146.4469	171.8469	197.2469	222.6469
25/32	.78125	19.8438	45.2438	70.6438	96.0438	121.4438	146.8438	172.2438	197.6438	223.0438
51/64	.796875	20.2406	45.6406	71.0406	96.4406	121.8406	147.2406	172.6406	198.0406	223.4406
13/16	.8125	20.6375	46.0375	71.4375	96.8375	122.2375	147.6375	173.0375	198.4375	223.8375
53/64	.828125	21.0344	46.4344	71.8344	97.2344	122.6344	148.0344	173.4344	198.8344	224.2344
27/32	.84375	21.4313	46.8313	72.2313	97.6313	123.0313	148.4313	173.8313	199.2313	224.6313
55/64	.859375	21.8281	47.2281	72.6281	98.0281	123.4281	148.8281	174.2281	199.6281	225.0281
7/8	.875	22.225	47.625	73.025	98.425	123.825	149.225	174.625	200.025	225.425
57/64	.890625	22.6219	48.0219	73.4219	98.8219	124.2219	149.6219	175.0219	200.4219	225.8219
29/32	.90625	23.0188	48.4188	73.8188	99.2188	124.6188	150.0188	175.4188	200.8188	226.2188
59/64	.921875	23.4156	48.8156	74.2156	99.6156	125.0156	150.4156	175.8156	201.2156	226.6156
15/16	.9375	23.8125	49.2125	74.6125	100.0125	125.4125	150.8125	176.2125	201.6125	227.0125
61/64	.953125	24.2094	49.6094	75.0094	100.4094	125.8094	151.2094	176.6094	202.0094	227.4094
31/32	.96875	24.6063	50.0063	75.4063	100.8063	126.2063	151.6063	177.0063	202.4063	227.8063
63/64	.984375	25.0031	50.4031	75.8031	101.2031	126.6031	152.0031	177.4031	202.8031	228.2031

Bearings And Housings Matching Table

Housing Bearing     		UC	UK	NA	SA	SB
	P	UCP	UKP	NAP	SAP	SBP
	F	UCF	UKF	NAF	SAF	SBF
	FL	UCFL	UKFL	NAFL	SAFL	SBFL
	T	UCT	UKT	NAT	SAT	SBT
	FC	UCFC	UKFC	NAFC	SAFC	SBFC
	PH	UCPH	UKPH	NAPH	SAPH	SBPH
	PA	UCPA	UKPA	NAPA	SAPA	SBPA
	HA	UCHA	UKHA	NAHA		
	FB	UCFB	UKFB	NAFB		
	FA	UNFA	UKFA	NAFA		
	C	UCC	UKC	NAC	SAC	SBC
	LP				SALP	SBLP
	FL				SALF	SBLF
	FD				SAFD	SBFD
	PP	UCPP	UKPP	NAPP	SAPP	SBPP
	PF	UCPF	UKPF	NAPF	SAPF	SBPF
	PFL	UCPFL	UKPFL	NAPFL	SAPFL	SBPFL

CONVERSION GUIDE

CONVERSION FORMULAE

LENGTH

To convert

milli-inches into micrometres	25.4
inches into millimetres	25.4
inches into centimetres	2.54
inches into metres	0.0254
feet into millimetres	304.8
feet into centimetres	30.48
feet into metres	0.3048
yards into metres	0.9144
fathoms into metres	1.8288
chains into metres	20.1168
furlongs into metres	201.168
miles, statute into kilometres	201.168
miles, nautical into kilometres	1.852

Multiply by

25.4
25.4
2.54
0.0254
304.8
30.48
0.3048
0.9144
1.8288
20.1168
201.168
201.168
1.852

VOLUME & CAPACITY

To convert

cubic inches into cubic centimetres	16.387064
cubic inches into litres	0.016387
cubic feet into cubic metres	0.0283168
cubic feet into litres	28.316847
cubic yards into cubic metres	0.7645549
UK pints into litres	0.5682613
UK quarts into litres	1.1365225
UK gallons into litres	4.54609
UK gallons into cubic metres	0.0045461
UK fluid ounces into cubic centimetres	28.413063

Multiply by

16.387064
0.016387
0.0283168
28.316847
0.7645549
0.5682613
1.1365225
4.54609
0.0045461
28.413063

AREA

To convert

square inches into square millimetres	645.16
square inches into square centimetres	6.4516
square feet into square centimetres	929.0304
square feet into square metres	0.092903
square yards into square metres	0.836127
square yards into acres	0.083613
acres into square metres	4046.8564
acres into hectares	0.4046856
square miles into square kilometres	2.589988

Multiply by

645.16
6.4516
929.0304
0.092903
0.836127
0.083613
4046.8564
0.4046856
2.589988

MASS

To convert

grains into milligrams	64.79891
grains into metric carats	0.323995
grains into grams	0.064799
pennyweights into grams	1.555174
ounces into grams	28.349523
ounces troy into grams	31.103477
ounces into kilograms	0.0283495
pounds into kilograms	0.4535924
stones into kilograms	6.3502932
hundredweights into kilograms	50.802345
tons into kilograms	1016.0469
tons into metric tonnes	1.01605
tahils into grams	37.799
kati into kilograms	0.60479

Multiply by

64.79891
0.323995
0.064799
1.555174
28.349523
31.103477
0.0283495
0.4535924
6.3502932
50.802345
1016.0469
1.01605
37.799
0.60479

POWER

To convert

foot pounds-force per second into watts	1.35582
horsepower into watts	745.7
foot pounds-force per second into kilowatts	0.001356
horsepower into kilowatts	0.7457
horsepower into metric horsepower	1.01387

Multiply by

1.35582
745.7
0.001356
0.7457
1.01387

VELOCITY

To convert

feet per second into centimetres per second	30.48
feet per second into metres per second	0.3048
miles per hour into kilometres per hour	1.609344

Multiply by

30.48
0.3048
1.609344

FORCE

To convert

pounds force into newtons	4.44822
poundals into newtons	0.138255

Multiply by

4.44822
0.138255

TEMPERATURE

To convert from degrees Fahrenheit to Centigrade:

To convert from degrees Centigrade to Fahrenheit:

$$(X^{\circ}\text{F} - 32) \times \frac{5}{9} = Y^{\circ}\text{C}$$

$$(Y^{\circ}\text{C} \times \frac{9}{5}) + 32 = X^{\circ}\text{F}$$

MOTORING CONVERSIONS

These Conversion charts indicate relative values. They are intended only as a guide and should not be used to calculate higher values where more than three decimal places would be needed.

FUEL CONSUMPTION

L/100km	=	mile/gal	mile/gal	=	L/100km
6.0	=	47.06	10	=	28.248
7.0	=	40.34	12	=	23.540
8.0	=	35.30	14	=	20.177
8.5	=	33.22	16	=	17.655
9.0	=	31.38	18	=	15.693
9.5	=	29.73	20	=	14.124
10.0	=	28.24	22	=	12.840
10.5	=	26.90	24	=	11.710
11.0	=	25.67	26	=	10.864
11.5	=	24.56	28	=	10.088
12.0	=	23.53	30	=	9.416
12.5	=	22.59	32	=	8.827
13.0	=	21.72	34	=	8.308
13.5	=	20.92	36	=	7.846
14.0	=	20.17	38	=	7.433
14.5	=	19.48	40	=	7.062
15.0	=	18.83	42	=	6.726
16.0	=	17.65	43	=	6.561
17.0	=	16.61	44	=	6.420
18.0	=	15.69	45	=	6.279
19.0	=	14.86	46	=	6.137
20.0	=	14.12	47	=	5.996
21.0	=	13.44	48	=	5.855
22.0	=	12.83	49	=	5.713
23.0	=	12.27	50	=	5.572

TYRE PRESSURE

lb/in ²	=	kPa	kPa	=	lb/in ²
25	=	172.36	155	=	22.48
26	=	179.26	160	=	23.20
27	=	186.16	165	=	23.93
28	=	193.05	170	=	24.66
29	=	199.95	175	=	25.38
30	=	206.84	180	=	26.11
31	=	213.74	185	=	26.83
32	=	220.63	190	=	27.56
33	=	227.53	195	=	28.28
34	=	234.42	200	=	29.00
35	=	241.31	205	=	29.73

SPEED

km/h	=	mile/h	mile/h	=	km/h
5.00	=	3.12	10	=	16
10.00	=	6.25	15	=	24
15.00	=	9.37	20	=	32
20.00	=	12.50	25	=	40
25.00	=	15.62	30	=	48
30.00	=	18.75	35	=	56
35.00	=	21.87	40	=	64
40.00	=	25.00	45	=	72
45.00	=	28.12	50	=	80
50.00	=	31.25	55	=	88
55.00	=	34.37	60	=	96
60.00	=	37.50	65	=	104
65.00	=	40.62	70	=	112
70.00	=	43.75	75	=	120
75.00	=	46.87	80	=	128
80.00	=	50.00	85	=	136
85.00	=	53.12	90	=	144
90.00	=	56.25	95	=	152
95.00	=	59.37	100	=	160
100.00	=	62.50	105	=	168
105.00	=	65.62	110	=	176
110.00	=	68.75	115	=	184
115.00	=	71.87	120	=	192
120.00	=	75.00	125	=	200
130.00	=	81.25	130	=	208
140.00	=	87.50	135	=	216
150.00	=	93.75	140	=	224

IMPERIAL SYSTEM

LENGTH

1000 milli-inches	=	1 inch
12 inches	=	1 foot
3 feet	=	1 yard
5.5 yards	=	1 rod
220 yards	=	1 furlong
40 rods	=	1 furlong
5280 feet	=	1 mile
1760 yards	=	1 mile
8 furlongs	=	1 mile
3 miles	=	1 league
25 links	=	1 rod
100 links	=	1 chain
66 feet	=	1 chain
22 yards	=	1 chain
4 rods	=	1 chain

LENGTH (NAUTICAL)

6 feet	=	1 fathom
100 fathoms	=	1 cable length (approx)
10 cable lengths	=	1 nautical mile

AREA

144 sq ins	=	1 sq foot
9 sq feet	=	1 sq yard
30.25 sq	=	1 sq rod
484 sq yds	=	1 sq chain
1210 sq yds	=	1 rood
4840 sq yds	=	1 acre
160 sq rods	=	1 acre
640 acres	=	1 sq mile

AVOIRDUPOIS WEIGHT

437.5 grains	=	1 ounce
16 drams	=	1 ounce
7000 grains	=	1 pound
256 drams	=	1 pound
16 ounces	=	1 pound
14 pounds	=	1 stone
2 stones	=	1 quarter
100 pounds	=	1 cental
112 pounds	=	1 cwt
4 quarters	=	1 cwt
35840 ounces	=	1 ton
2240 pounds	=	1 ton
20 cwt's	=	1 ton

APOTHECARIES' WEIGHT

20 grains	=	1 scruple
3 scruples	=	1 dram
8 drams	=	1 ounce
12 ounces	=	1 pound

Ounce and pound are the same as in Troy Weight.

TROY WEIGHT

24 grains	=	1 pwt
20 pwt	=	1 ounce
12 ounces	=	1 pound

Used for weighting gold, silver and jewels.

VOLUME

1728 cu ins	=	1 cu foot
46656 cu ins	=	1 cu yard
27 cu ins	=	1 cu yard

CAPACITY

8 fluid drams	=	1 fluid ounce
5 fluid ounces	=	1 gill
20 fluid ounces	=	1 pint
4 gills	=	1 pint
40 fluid ounces	=	1 quart
2 pints	=	1 quart
160 fluid ounces	=	1 gallon
8 pints	=	1 gallon
4 quarts	=	1 gallon
2 gallons	=	1 peck
4 pecks	=	1 bushel
8 gallons	=	1 bushel
64 gallons	=	1 quarter
31 1/2 gallons	=	1 barrel
2 barrels	=	1 hogshead

MARINERS' MEASURE

6 feet	=	1 fathom
120 fathoms	=	1 cable length
7 1/2 cable lengths	=	1 mile
5,280.2 feet	=	1 statute mile
6,080.2 feet	=	1 nautical mile

SURVEYORS' MEASURE

7.92 inches	=	1 link
25 links	=	1 rod
4 rods	=	1 chain
10 sq chains	=	1 acre
or 160 sq rods		
640 acres	=	1 square mile
36 sq miles	=	1 township
(6 miles sq)		

METRIC SYSTEM

LENGTH

1000 picometres	=	1 nanometre
1000 nanometres	=	1 micrometre
1000 micrometres	=	1 millimetre
10 millimetres	=	1 centimetre
100 millimetres	=	1 decimetre
10 centimetres	=	1 decimetre
1000 millimetres	=	1 metre
100 millimetres	=	1 metre
10 decimetres	=	1 metre
100 metres	=	1 hectometre
1000 metres	=	1 kilometre
1852 nautical metres	=	1 international nautical mile

AREA

100 sq millimetres	=	1 sq centimetre
100 sq centimetres	=	1 sq decimetre
10 000 sq centimetres	=	1 sq metre
100 sq decimetres	=	1 sq metre
10 000 sq metres	=	1 hectare
100 hectares	=	1 sq kilometre

MASS

1000 micrograms	=	1 milligram
200 milligrams	=	1 metric carat
1000 milligrams	=	1 gram
5 metric carats	=	1 gram
1000 grams	=	1 kilogram
1000 kilograms	=	1 megagram
	=	1 tonne

ENERGY (WORK & HEAT)

1000 millijoules	=	1 joule
1000 joules	=	1 kilojoule
1000 kilojoules	=	1 megajoule
3.6 megajoules	=	1 kilowatt hour
1000 megajoules	=	1 gigajoule
1000 gigajoules	=	1 terajoule

TIME

1000 nanoseconds	=	1 microsecond
1000 microseconds	=	1 millisecond
1000 milliseconds	=	1 second
1000 seconds	=	1 kilosecond

VELOCITY

3.6 kilometres per hour	=	1 metre per second
3600 kilometres per hour	=	1 kilometre per second

ELECTRICITY & MAGNETISM

1000 picoamperes	=	1 nanoampere
1000 nanoamperes	=	1 microampere
1000 microamperes	=	1 milliampere
1000 milliamperes	=	1 ampere
1000 amperes	=	1 kiloampere
1000 milliloculombs	=	1 coulomb
1000 coulombs	=	1 kilocoulomb
1000 millivolts	=	1 millivolt
1000 millivolts	=	1 volt
1000 volts	=	1 kilovolt
1000 kilovolts	=	1 megavolt
1000 microhms	=	1 milliohm
1000 milliohms	=	1 ohm
1000 ohms	=	1 kilohm
1000 kilohms	=	1 megohm
1000 megohms	=	1 gigohm
1000 millisiemens	=	1 siemen
1000 millihenrys	=	1 henry
1000 milliteslas	=	1 tesla

POWER

1000 microwatts	=	1 milliwatt
1000 milliwatts	=	1 watt
1000 watts	=	1 kilowatt
1000 kilowatts	=	1 megawatt
1000 megawatts	=	1 gigawatt
1000 gigawatts	=	1 terawatt

VOLUME & CAPACITY

1000 cu millimetres	=	1 cu millimetre
1000 centimetres	=	1 cu decimetre
1000 cu decimetres	=	1 cu metre
1 millilitre	=	1 centimetre
10 millilitres	=	1 centilitre
10 centilitres	=	1 decilitre
1000 millilitres	=	1 litre
100 centilitres	=	1 litre
100 litres	=	1 hectolitre
1000 litres	=	1 kilolitre
	=	1 cu metre
10 hectolitres	=	1 kilolitre

PRESSURE AND STRESS

1000 micropascals	=	1 millipascal
1000 millipascals	=	1 pascal
100 pascals	=	1 millibar
1000 pascals	=	1 kilopascal
10 millibars	=	1 kilopascal
1000 kilopascals	=	1 megapascal
1000 megapascals	=	1 gigapascal

DENSITY & CONCENTRATION

1 gram per cu metre	=	1 milligram per cu decimetre
1000 milligrams per cu decimetre	=	1 gram per cu decimetre
	=	1 kilogram per cu metre
1000 kilograms per metre	=	1 tonne per cu metre
	=	1 kilogram per cu decimetre

FORCE

1000 micronewtons	=	1 micronewton
1000 millineutons	=	1 newton
1000 newtons	=	1 kilonewton
1000 kilonewtons	=	1 meganewton



Ball & Roller Bearings



Automotive Bearings



Pillow Block Bearings

